MINING CONGRESS JOURNAL

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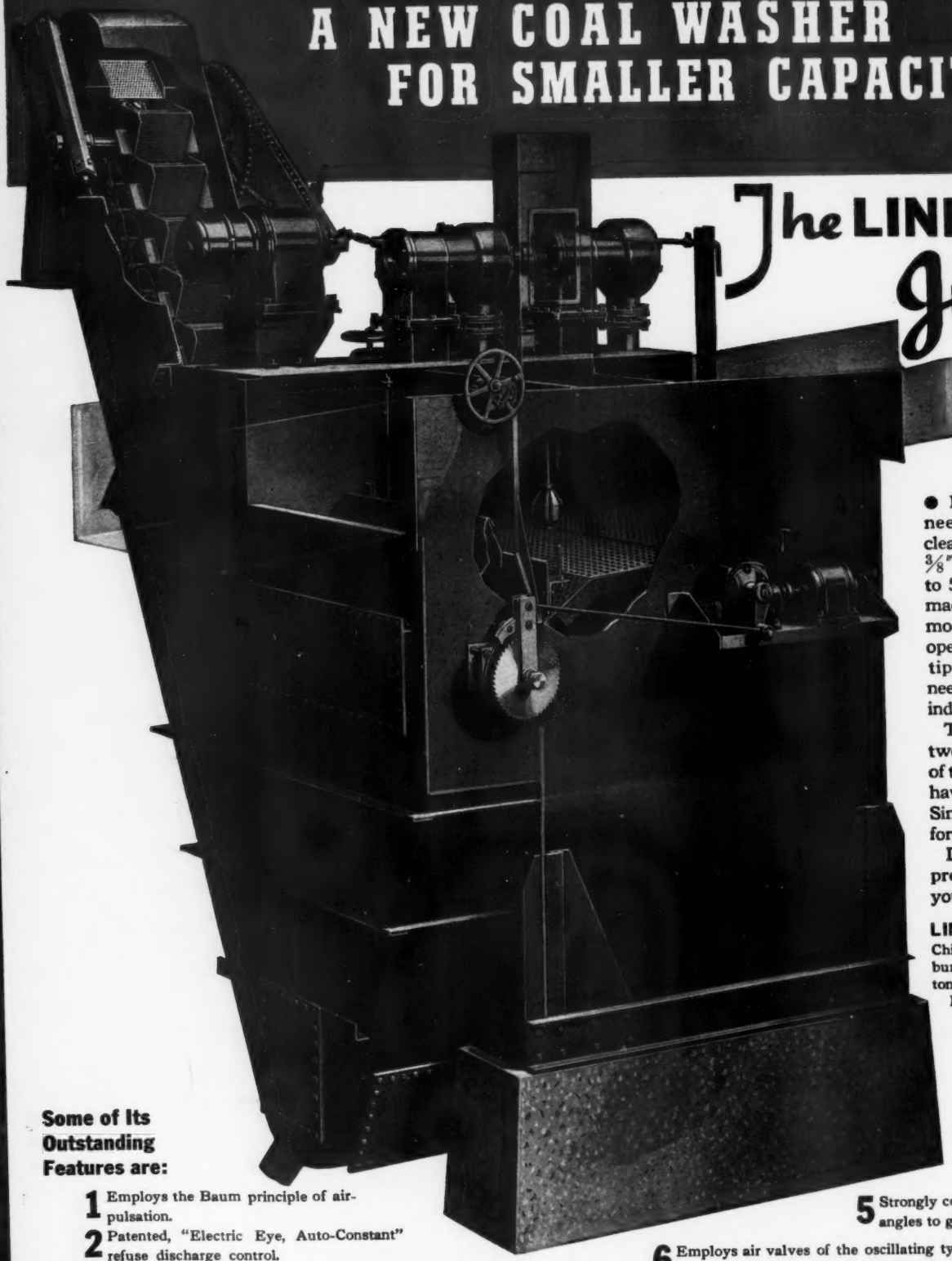
A NEW COAL WASHER FOR SMALLER CAPACITIES



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★ SHAFT SINKING, VENTILATION, POWER, PUMPING, MAINTENANCE, ETC., ETC.

A COMPLETE RECORD OF THE
1938 COAL CONVENTION AND EXPOSITION

★

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$1161 INVESTED IN THESE BETHLEHEM TIES

saves $3005 in a year

According to actual experience of Hanna Coal Company.

These 1680 Bethlehem No. 3 Steel Ties represent part of a year's supply for Hanna Coal Company's Willow Grove Mine. They cost $1161. According to coal company figures, they will save, compared to wood ties, $3005 during the coming year. Here is how this figure is arrived at from data supplied by Hanna Coal Company: These ties will be used in rooms which have an average life of 2500 tons. According to careful check, the labor cost of installation and recovery will be seven cents apiece. For wood ties it is double that.

Though wood ties have lower first cost, they can be used only three times, or four at the outside, before spike-killing puts them out of service. In the course of one year, figuring on maximum life, five sets of wood ties are required—at a cost of $1411. One set of steel ties will last the year and make a good start toward another twelve months. Cost, delivered, for steel ties was $1161. Labor, for installing and removing them, will amount to $2352—for wood ties, it would run to $4704 plus $403 for spikes. Net saving—$3005 annually.

Why this saving is possible. Advantages of Bethlehem Steel Mine Ties are these: Labor costs are lower because these ties do not require spiking, gaging, or tie rods. Steel clips, permanently fastened to the tie, hold rails firmly in place, rigidly maintain proper gage. A blow or two with hammer or ax locks the rail in place. Twenty to thirty installations are commonplace with these rugged ties. Track goes in faster, with less cost; once in, it is safer.

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"To say I'm sold on Tobin Bronze is putting it mildly. For more than 20 years, I have used this welding rod... and today all of us prefer it to any other. Why? Because Tobin Bronze is more economical to use and helps my men make better, more dependable welds."—C. G. Blackwell, Dayton Welding Co., Dayton, Ohio.

Broken castings made "like new"

Tobin Bronze enables welders to reclaim broken castings which otherwise would need to be replaced at great expense

The danger of cracking and warping prohibited the use of methods involving preheating for the welding of this unsupported cast-iron platform. Tobin Bronze made furnace preheating unnecessary and the low welding temperature minimized risk of distortion and shrinkage.

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Straightway the broken casting is made "like new" at ridiculously small expense.

Extensive preheating is usually unnecessary for Tobin Bronze welding. Welds are made by heating the surface of the weld area to a red heat only. Thus Tobin Bronze welding saves time, gas and money, and reduces the possibility of distortion.

This time-tried Anaconda welding rod carries the trade-mark "Tobin Bronze registered U. S. Patent Office" on each rod. Look for it—get the genuine.

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as this O-B section insulator switch was installed

● Tutankhamen's tomb was discovered and—more obscurely—an O-B Section Insulator Switch began its career in a Pennsylvania coal mine. That was in 1923!

Take a look at this switch as it appears now. Yes, it's a bit weather-beaten and time-worn when you compare it with the more recently installed O-B pole bracket and Type N Hanger. But it's still on the job with no sign of retreat—and no quarter asked or given!

That picture tells a powerful story. It speaks volumes for the durability and efficiency of this particular type of switch as well as for the rest of the O-B family of products. It seems to shout, "Look at me! Fifteen long years on the job—and still holding up my end!"

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MANSFIELD OHIO, U. S. A.

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont., Canada

1971-M

O-B M-2 and M-3 Section Insulator Switches

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MINING CONGRESS JOURNAL

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Where would the mining industry be without the splendid help of alert manufacturers cooperating to solve its problems?

The July number will feature a large number of excellent articles written by the manufacturers themselves, depicting recent strides made in meeting the industry's needs.

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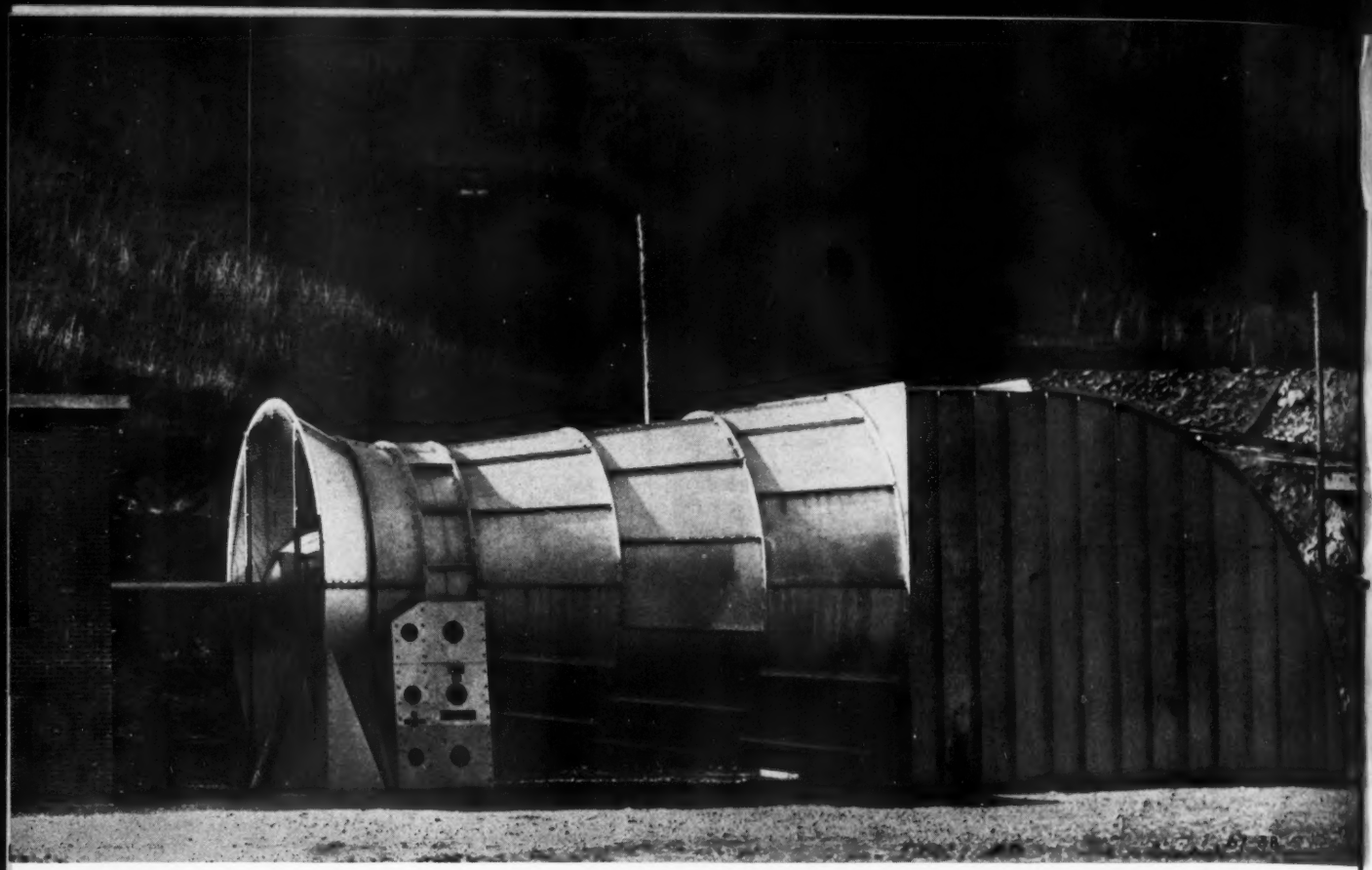


THE WORLD'S LARGEST PROPELLER MINE FAN AT CARTER COAL CO.'S OLGA NO. 2 MINE

It's the world's largest propeller type mine fan, this Jeffrey Aerodyne installed at Carter Coal Company's Olga No. 2 mine, Caretta, W. Va. Having a wheel diameter of 13½', it is rated to produce 448,000 c.f.m. at 5¾" water gauge.

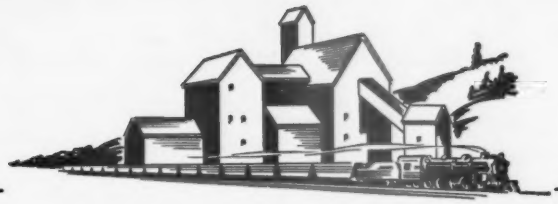
Spectacular and interesting, of course . . . but the size is unimportant except as it proves a point—why the Aerodyne was chosen for this important job. And here are the reasons:

The Aerodyne cuts costs decidedly . . . consumes less power because it develops static efficiencies up to 90% . . . and is low in installation cost. When more volume is needed, a second Aerodyne of any size may be installed in parallel without loss of efficiency . . . an investment saving.

Add to these economies the advantage which the Aerodyne offers in air reversal without doors, and you see why it was chosen for the big majority of mine fan replacements last year . . . why it warrants your investigation even though your present fan may be relatively new—The Jeffrey Mfg. Co., Columbus, Ohio.

Jeffrey

A FAN FOR EVERY PURPOSE



The Icy Hand of Regimentation

THE only remedy for starvation is food—not only a plenty of food but also its proper distribution.

Want and available plenty represent the two extremes; between these lie all the agencies of transportation and distribution, and the facilities of exchange, money and credit, built up by an intelligent people as a means of service and profit. These agencies may not all be profitable, but all were created by individual enterprises for purposes of profit.

A perfect business system anticipates the satisfaction of every human want. That system may be composed of many separate units, each independent of all others, yet necessary to the effective operation of the whole. The man who fells timber in the Oregon forest has no conception of his part in the greater program. He works for so much per day, and, having been paid, he does not consider the particular importance of the part he has played. His part is only to know that his work justifies his employment by the lumberman, who, through various channels, in the end provides material for some distant and important enterprise.

That axeman's labor is absolutely essential, as is, also, the employer who hires him, the teamster who hauls his output to the railroad or the river, the loader at the railway station or the raftsman on the river who moves the logs to the sawmill and the sawyer who makes lumber of the logs.

All these processes are necessary before lumber is available to be transported and utilized in the industries of the world.

To regiment these processes without hampering efficiency is utterly impossible; to regiment them without an increase in cost at every point is impossible.

Costs of production are necessarily increased by every governmental interference, not only by the taxes which it charges for this supposed service, but by loss of efficiency brought about by the effort of parlor experts to direct operations requiring special skill and experience. All these interferences slow down the current of progress, increase costs, raise price levels and make for scarcity and want.

Everywhere, the icy hand of Government control is reaching further and further for more tax money to support the dam of regimentation which it has built and is building in its destruction of local self-government and its centralization of power in Washington. This movement, powerfully destructive of the American System, began under the name of conservation, later it was called progressive and now it is known as the New Deal. It is maintaining its political support by special distribution of taxpayers' money to communities which, while they do not know it, will eventually be obliged to pay back not only the cost of the improvements but also the waste brought about through inefficient administration.

The Government cannot by any possibility add to the efficiency of any industrial agency. It cannot speed up—it can only slow down activity, and it must tax for its service. The active control by the million specialists who are the backbone of American industry, each impelled by the profit motive energetically to prosecute his work which above all others he best understands, is the only hope for the abundant life.

J. F. Ellsworth

A JOURNAL FOR THE ENTIRE MINING INDUSTRY—PUBLISHED BY THE AMERICAN MINING CONGRESS

MINING CONGRESS JOURNAL

Vol. 24 JUNE, 1938 No. 6

Richard J. Lund, Editor

TOWARD COOPERATION WITH S.E.C.

FOR more than a year Mr. Samuel H. Dolbear, Chairman of the American Mining Congress Committee for Cooperation with the Securities and Exchange Commission, has been canvassing mining companies which have dealings with the Securities and Exchange Commission in the registration of issues of securities. The questionnaires submitted by Mr. Dolbear have met with a ready response from approximately one-third of the registrants, but for a comprehensive survey of experience it is highly important to the welfare of mining that a more general response be made.

It is the purpose of the Committee to continue in its agreeable relation with the Securities and Exchange Commission in the work of developing a more complete understanding and an improved working basis for mine financing. The registration forms and the administrative procedure of the Commission are not as yet finally determined, and changes in the interest of simplification and expedition in the handling of mining registrations are among the objectives of the SEC Committee's work. Officials of the SEC with whom these matters have been discussed are unanimous in their desire to improve the present procedure along constructive lines. Mining registrants will aid the cause of mining by responding promptly to these inquiries, with the fullest assurance that all material will be treated in strict confidence by the Committee.

ANTHRACITE FOR CANADA

IN present times and especially on the North American continent it is rather strange to think of the existence of a tariff against a commodity which is not produced and in fact does not occur within national boundaries.

The levying of a tariff for revenue only is at times justifiable when nations are very young or when they are in dire need. Such is not the case with Canada, and it is further true that throughout the vast expanses of the friendly country to the north there are no commercially exploitable deposits of anthracite. Furthermore, the Canadian concept is that of an economy of plenty—to encourage new production of natural resources and to provide enough for all at reasonable prices, with only such revenues as are needed for a minimum of governmental activity.

Unfortunately, there is a barrier in evidence today which operates against the movement of Pennsylvania anthracite into Canada. There is a duty of 50c per ton and also an excise tax of 3 percent imposed upon the value of anthracite F.O.B. mines. These two levies come to a total of approximately 70c per ton.

In spite of this barrier, shipments of Pennsylvania anthracite to Canada increased by approximately 350,000 tons in 1937 over 1936, as a result of a marked decrease in the mine price. With the lower prices of today there is an excellent opportunity to increase shipments by an additional 1,000,000 tons per year to somewhere near the former normal total of over 4,000,000 tons if this tariff barrier can be removed. The effect of this additional production upon the mine and railroad wage earners in the anthracite field and upon the dependent communities is readily realized.

It is known that the distributors of anthracite in Canada have petitioned their government for the removal of the 70c barrier to the very natural market which Canada provides and which is capable of restoration and expansion. In presenting this situation to the Committee for Reciprocity Information in connection with the proposed Foreign Trade Agreement with Canada, a joint appeal was made by Executive Director Louis C. Madeira, III, of the Anthracite Institute; President J. J. Pelley, Association of American Railroads; and Secretary-Treasurer Thomas Kennedy, of the United Mine Workers of America. Thus mine operators, mine workmen, the transporting railroads, and the distributors are working together on a problem of mutual concern and there is every reason to hope that the promulgation of the new Canadian Foreign Trade Agreement will bring increased production and prosperity to the anthracite region.

Model city of Rio Tinto, Nevada. At left may be seen the modern apartments described in detail on following pages; in center the individual homes, and at right the shaft and mill of the Mountain City Copper Mine

Mountain City Copper Mine†

• ***Principal Copper Discovery in Recent Years Attributable to Frank Hunt's Persistent Faith and Hard Work***

By GAIL MARTIN
Salt Lake City, Utah

NEARLY everyone at some time has wished that he possessed Aladdin's magic lamp. One rub, and the genie appears, champing at the bit, to do one's bidding. Presto, and the genie piles up glittering treasure, builds a fair city, makes the desert fruitful as a garden. Art, commerce, industry flourish where none was ever known before. All the while, one leans back in the shade on a silken couch, quaffing delectable drinks.

Such stuff, snorts the scoffer, is only for boyish dreams. You're right, mister, in the main, but you never heard of S. Frank Hunt, the old prospector who, though nearing the Biblical allotment of three score years and ten, went out into the Nevada desert and came back a millionaire.

Old Man Hunt had no Aladdin's lamp. He had only a spluttering carbide lantern. One could rub at this all day and no rip-snorting genie would appear. But Hunt had something almost as potent—geological knowledge, determination, and plenty of elbow-grease. He could swing a wicked single jack, and do a man's sized job of pick and shovel work.

Out of these he has "passed a miracle" as wonderful as any of those told about in Arabian Nights. Ten years ago the model city of Rio Tinto, Nev., was never even heard of. In the winter time dark clouds glowered down on its rolling sage-garbed barrens. On hot summer days lizards lay panting in the shade for air. Dry winds sent the sand scurrying through the greasewood. But now, where only the jackrabbit and the lean coyote eked out an existence, there stands a prosperous mining camp. Under a spacious night sky its electric lights glitter tirelessly. Twenty-four hours a day the dull roar of the mill sounds its chant in praise of industry. Motor truck caravans, loaded with rich copper concentrate, wheel their way 117 miles to the railroad station. Scores of families live in snug copper-roofed homes. School children answer the call of the school bell each morning. If this isn't a miracle, what is?

But there is something else that most people forget. Even Frank Hunt's courage and industry would have been unavailing without another item of equal importance—money, hard-earned cash, capital.

Before the Mountain City Copper mine produced a dime, before a pound of ore was shipped, nearly one million dollars had to be spent to gain stock control. Another million dollars had to be spent to open up the deposit, equip the mine, build roads, mill and camp.

So a lot of "intestinal fortitude" was displayed and a lot of engineering skill had to be utilized by the International Smelting Company to develop its baby into a lusty, long-time producer. And it didn't make the work any easier to have the discovery of the mine thrust upon a pessimistic world at the depths of the depression, when copper was selling around five and six cents a pound, and prophets were predicting the end of our economic system.

Nearly every mine investor in Utah

† *Prepared with the cooperation of J. O. Elton, president, Mountain City Copper Company, and his staff.*

kicks himself mentally when he thinks of Mountain City Copper hitting $17.50. Yet stock in this same mine was being given away during 1930, and the promoters had to run hard to make people take it. Frank Hunt, who had bales of the stuff when the payoff came, it is said, had a paper profit of six to seven million dollars.

Hunt's Courageous Persistence

But it wasn't always so. Old Man Hunt traveled the hard way. He had known what it was to be a down-and-out prospector, nearing 70 years of age. To make the Mountain City Copper a bonanza, he had to be cook and bottle-washer, financier, time-keeper, teamster, truck-driver, geologist, manager, mucker and assayer.

Blizzards he had bucked in a Ford truck over sheep trails blatantly called roads. When pack-horses could or would go no further, he proxied for them. He had performed miracles of finance borrowing from Peter to pay Paul. He had hustled food, powder and rails from friendly neighbors until the next check came.

No doubt he sometimes chuckled to himself. A prospector he had wanted to be when he was a youth. His father had been a doctor. Born at Monrovia, Ind., October 7, 1863, early in life young Hunt decided to be a mine operator, so he came to Colorado. Several of his relatives had made names for themselves as scientists. One uncle was a geologist.

Lured by the mystery eternally brooding over mountain and desert, young Hunt read all he could on geology and mineralogy. Man's chance to create clean, new wealth through a combination of luck, zeal and knowledge fascinated him. At the age of 24 he was rewarded. He and a partner discovered the deposit that later became the Empire Zinc mine. But during the panic of 1893 a comfortable fortune melted away and young Hunt became a rover again.

Camps in Colorado, Utah, Nevada and Alaska knew his searching gaze. He continually grappled to wrest from the underground a share of its hidden wealth. On his return from Alaska he landed on the Yakima Valley Irrigation project, where he followed construction work. A broken leg, which still causes him to limp, laid him up for a long time. During 1916 and 1917, when well over 50 and while recovering his health, he attended the University of Washington to slake his insatiable thirst for more knowledge of prospecting, mining and milling.

Again the spell of the desert won. Frank Hunt turned his battered car toward Mountain City, Nev., once a gold camp in the roaring '70s. It didn't take him long to see that Mountain City was through as a gold producer; but in checking over the surrounding area, about three miles south of the dying camp, he found a huge gossan outcrop.

Picking up a chunk of it, he took it back to town. "Not worth ten cents a ton!" exclaimed an old Mountain City prospector, who had single-jacked a tunnel into the same outcrop. But Frank Hunt was not satisfied. The next day he returned. A second visit indicated to him that here was a wide fissure. Below the iron outcrop there should be a rich deposit.

Ten long years of struggle followed. Foot by foot, the incline shaft sunk single-handed by Hunt groped through the iron gossan for the deposit buried at depth. In a decade of lean, weary and discouraging years the incline had traveled but 50 feet. Hunt persuaded a Salt Lake man to grubstake him. When funds ran low he shipped from a lease on the Jackson mine in Elko County. Then came the depression of 1929. His Salt Lake backer, becoming tired of his bargain, sent learned engineers and geologists to Mountain City to check up on Hunt's dream. They came back and reported that money might as well be thrown into the street as invested in the mine. The Salt Laker showed Old Man Hunt the door.

But the old man's determination did not wilt. Doggedly he pounded the pavements of Salt Lake City trying to raise funds. Operators, smelting companies, promoters—all turned the cold shoulder.

Finally the day came when all resources seemed exhausted. One more stratagem had to be resorted to. With a Salt Lake broker, Ogden C. Chase, for partner, Hunt organized the Rio Tinto Copper Company. Space was bought in mining papers. An extensive mail-order campaign was carried on. Rio Tinto stock, it was announced, would be given to all who would promise to pay five cents a share in assessments.

Further Development Work

Wiseacres snickered at this offer and said that Chase and Hunt could not run fast enough to give them the stock. However, a sufficient number of "suckers" bit. In the summer of 1931 Hunt and Chase's brother, George, and another co-worker, P. A. Christopherson, returned to the Rio Tinto, staked out more claims, built two cabins and prepared to install a compressor, power drills and a hoist.

In the fall Ogden Chase closed his brokerage office and came out to the mine. Slowly the incline shaft continued on its way to China. By March the men, who were taking stock for pay, would have walked off the job, but the snow was five feet deep. Frank Hunt was a sick man, yet he hung doggedly on, for the shaft had not reached the zone of secondary enrichment.

One night, Chase and his helper came up from the mine, their faces and hands black as Negroes.

"If we ain't got ore," they exclaimed, "we sure have got a coal mine."

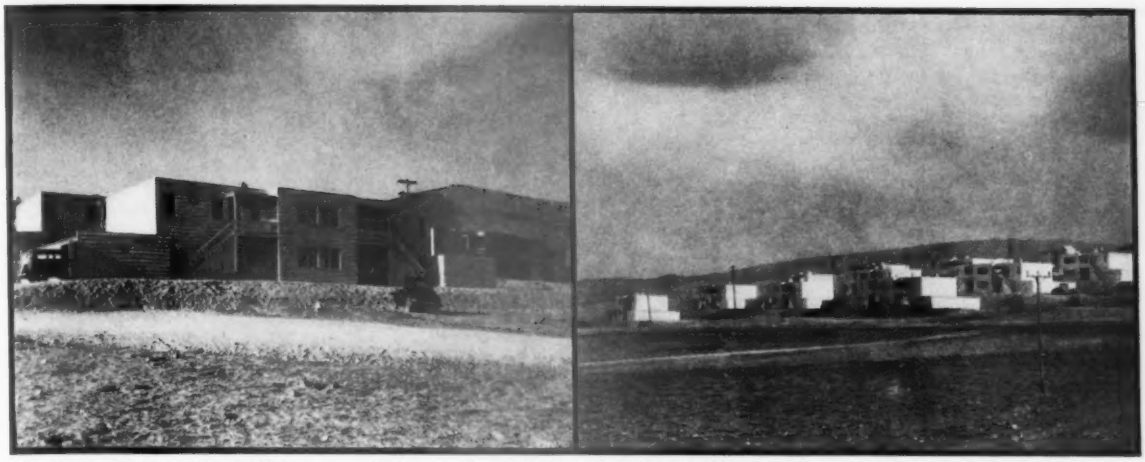
Frank Hunt took one look at the stuff. His hopes had not been misplaced. The "black stuff" was a rich copper sulphide. He had fulfilled his promises. Before the fifth stock assessment, before Broker Chase had to advance $7,000, the ore body had been reached. At once the stock jumped to 20 cents a share.

At 252 feet the shaft struck the top of a dome-like deposit midway between the hanging and the footwalls. By the time the roads were open 500 tons of 40 percent copper ore was piled on the dump. Development work on the 252 level exposed an ore body 76 feet wide with an estimated tonnage of 100,000 tons of ore carrying over 40 percent copper. The richest deposit of copper ore discovered any place in the West had been found!

Learned geologists and mining experts, who had laughed Hunt to scorn, on reading the Salt Lake papers of July 16, 1932, looked as if they had been struck with a pole-axe. Investors made a frantic search through bales of discarded mining stock to see if they had held on to their Rio Tinto. Frantic buying on the Salt Lake Mining Exchange sky-rocketed the stock. "Old Man" Hunt became a much sought and much consulted person.

About this time the International Smelting Company began to get busy. The mine was examined and pronounced a real find. On July 1, 1932, the International Smelting Company bought control from Hunt and Chase at 25 cents a share. Within a month five carloads of ore assaying 40 percent copper were shipped. In six weeks the International Smelting Company had started sinking a triple compartment shaft. Mildly speaking, results were gratifying:

On January 1, 1934, eighteen



Model furnished apartments (living room, kitchen, bath and bedroom), equipped with all modern conveniences, are available to workmen for fifteen dollars per month

months after acquisition of the mine by the International Smelting Company, the company reported ore reserves totaling 136,965,000 pounds of copper, with an average grade of 16.6 percent copper.

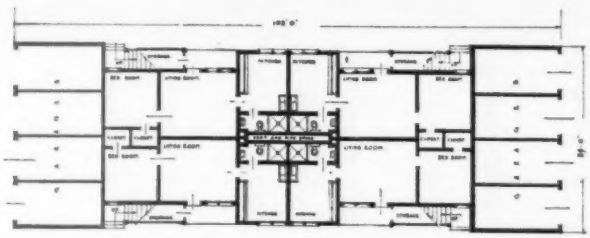
On January 1, 1935, two and a half years after acquiring the property, the annual report of the Mountain City Copper Company showed estimated ore reserves of 600,000 tons with 200,000,000 pounds of copper.

On January 2, 1936, three and a half years after the strike, the company, on a production of 150 tons daily, reported an operating profit ranging from $1,000,000 to $1,250,000 annually.

Four and a half years after Hunt's dramatic discovery, the mine was producing 450 tons daily, earnings were at the rate of $4,000,000 annually, the company had $600,000 in cash on hand, and the output of copper had risen to 4,000,000 pounds yearly.

A Model Town Rises on the Desert

Meanwhile the International Smelting Company had built on the desert a model town with trees, lawns, parking spaces along streets, a school, a recreation center, a hospital and a store. Eighty families, who had been quartered in tents and "packing-box" shacks, found housing in comfortable homes and apartments with all modern conveniences—running hot and cold water, sewage, baths, electric lights and refrigeration. For fifteen dollars a month a worker could occupy a furnished apartment, consisting of living room, kitchen, bath and bedroom. Each apartment has an outside entrance and its own garage. The company supplies electricity at one cent a kilowatt hour. For $3.50 a month a family has electricity for lighting, refrigeration and cooking. Fuel oil and coal are used for heating.



Sketch of first floor plan of above apartments

At a distance of 117 miles from the nearest railroad, these apartments were built at a cost of $1,185 per unit. Construction, however, was not skimped. Roofs and water pipes are all of copper. Walls between apartments are sound-deadened with an inch of rock wool. Outside walls, built of wood studs, one-inch sheathing and lap board with water-proof building paper between, are lined with insulating board, making the equivalent of 12 inches of brick. The flat roofs, built to drain down the center vent or pipe space, are likewise thoroughly insulated and constructed to withstand the weight of three feet of snow.

To construct such smartly fitted-out apartments 117 miles from the railroad at the unusually low cost of $1,185 an apartment, including the cost of garage, sewer system, septic tank, water system including fire lines, manholes and mains, electrical distributing system and transformers, a number of economies had to be practiced:

The buildings were planned so that square-cut, stock-length lumber could be used throughout, except on the stairs. The structural frame never required the cutting of more than one end of lumber. In many instances it could be used just as it came from the mill.

Bathrooms and kitchens were grouped in the centers of units so that long pipe runs could be eliminated.

Health and Sanitation Given Careful Attention

Believing that the health and comfort of its employes is its greatest asset, the Mountain City Copper Company has spared no expense to see that absolute sanitation prevails at Rio Tinto. Pure spring water is piped from two sources for culinary purposes. One spring is northwest of the camp. The supply here is sufficient for all needs save in dry seasons.

Another supply of cool, sparkling drinking water was developed by mining methods. A shaft was sunk 20 feet in the nearby Owyhee River bottom and a drift run 350 feet across the channel, not to tap water in the bed, but to develop it at a quartzite contact. This water, flowing 90 gallons a minute throughout the year, is piped through 4-in. pipe in a covered ditch a distance of a couple miles to Rio Tinto. Electrically operated

pumps lift the water from the springs to the tanks, one holding 125,000 gallons and the other 150,000 gallons. The water developed in the mine is used for milling purposes.

The company also maintains a modern 15-bed hospital equipped with an operating room, X-ray machine, offices and laboratory. There are rooms for private patients and wards for others. Dr. Terrell E. Seager is resident physician, and Dr. Paul Richards of Bingham, Utah, is consultant.

All employes are given physical examinations. Safety-first training and first-aid work is given. By reason of the company's insistence on "safety-first" rules, the accident rate is very low. Adequate mine rescue equipment is maintained at the mine for emergencies and rescue teams are carefully drilled against any need.

Importance of Modern Trucking

Neither the old camp of Mountain City nor the new camp of Rio Tinto have ever known the puffing of a heavy-laden locomotive engine or the shrill of a locomotive whistle. Probably had not the modern truck been developed, the district's exploitation would have been seriously handicapped. To the south, Elko, Nev., on the Southern Pacific and Western Pacific Railroads, lies 90 miles, and to the north, Mountain Home, Idaho, on the Union Pacific, lies 117 miles distant.

From the first, the State of Idaho beat Nevada to the punch, and built and maintained the better roads. As a result, Nevada is being bled of a large part of the income that flows from its resources. About 600,000 pounds of ore and concentrate daily, or 150 carloads monthly, are being shipped to the Idaho loading point. Back to the Nevada community come Idaho lumber, Idaho farm products, Idaho mine timbers, building supplies, and goods to be consumed by Nevada citizens.

However, the State of Nevada is hurrying to improve haulage conditions between Elko and Mountain City by eliminating the steep grades and sharp curves in the old wagon road. About 25 miles of new road has been graveled and oiled, and some time in 1938, it is thought, improved highways will divert some of the traffic southward to Elko.

Geologic Setup

Naturally, where as great an orebody is discovered as at Rio Tinto, mining men want to know what combination of geological conditions created such a phenomenal deposit. Company geologists are frank to acknowledge that, while a great deal has been learned, the time has not arrived for a detailed description. Until more exploration can be accomplished—and this will take time and patience—there will remain large gaps in the geology of the camp.

Surface formations have been heavily eroded. The characteristic features of the rock formations have been masked by gravel and shifting sand so that Nature has done its part to conceal mineralogical secrets. Furthermore, the facts gleaned from past development are closely guarded by companies, who naturally want to share in the benefits that follow as a result of their expenditures. However, this much is common information:

Although reputedly a gold-mining camp, Mountain City, like many another institution and personality, has not lived up to its reputation, say geologists. Mountain City, they insist, produced but little gold. These cold-blooded masters of disillusion declare that the excitement in the early days grew out of the discovery of silver veins in the granite batholith, lying two miles northeast of the mine. Enrichment of a secondary character

Above: Discovery shaft that struck the rich ore body on the 252 level. Shaft now extends to 400 level

Below: Production has ranged from 400 to 600 tons daily from the main shaft and modern mill

Early view of old camp and new shaft, before erection of mill. Old workings are at left center, in gulch

lay in shallow veins, whose values "petered" out at depth.

The mineralization in the Mountain City Copper mine occurs in a carbonaceous shale bed, which strikes east-west with a dip 80 degrees to the north. The shale bed, about 1,200 feet wide, lies between limestone and quartzite. The oldtimers had discovered this discolored shale bed decades before Old Man Hunt hit the camp.

But instead of sinking to depth to reach the secondary zone of enrichment as did Frank Hunt, the earlier prospectors drove a tunnel about 150 feet into the shale bed. They looked for gold, not copper. Without knowing it, they stood upon the richest copper bonanza ever to be opened in the West. In their preoccupation over developing a gold mine, they "booted" their chance of becoming millionaires and gave Old Man Hunt his chance to make name and fortune.

Now a number of other companies are prospecting in the district on claims surrounding the Mountain City Copper mine. Some encouragement for further work has been met with so that other discoveries and many additions to the present stock of geological information may be expected as the years go by.

Mining and Milling Methods

Mining problems at Rio Tinto are of minor importance. Because of the soft, friable nature of the carbonaceous shale, square-set stoping must be employed. The square-set stopes are carried up over short blocks and filled in orderly progression with waste from mining operations.

Three shafts have been sunk: (1) The Discovery Shaft, an incline, consisting of two compartments, which extends to the 400 level; (2) the Main Shaft, consisting of three hoisting and one pumping compartment, sunk to a depth of 765 feet with levels cut every hundred feet beginning at the 200, and extending down to and including the 700-foot level; and (3) a two-compartment ventilation shaft, located 700 feet west of the Main Shaft.

The mine is electrified throughout. Power has been brought in from Idaho by way of the old gold camp of Jarbridge, 30 miles distant. Hoisting is done by electricity. Mancha motors haul mine cars of 18 cubic feet capacity over 18-in. gauge rails. Most of the production comes from the 300 and 400 levels at present. Extensive development is being carried on in the lower levels, the company's report for 1937 states, to the westward of the limits of the main ore body.

Another view of mill and main shaft, with Discovery shaft at right

Production has ranged from 400 to 600 tons daily. At present about 25 percent of the tonnage produced is crude ore assaying from 25 to 35 percent copper. Crude mill ore carries from 6 to 8 percent copper, with practically no values in silver or gold.

Flotation floor in the new mill. Denver-Fahrenwald and Fagergren machines are used

Secondary chalcocite and chalcopyrite are the principal minerals.

Milling procedure is standard. Crushing is done in a Blake crusher and a Symons Cone mill, each having a capacity of 450 tons daily. Fine grinding—70 percent through a 200-mesh—is done in a No. 86 Marcy mill. Denver-Fahrenwald and Fagergren flotation machines are used. The finished product carrying about 25 percent iron and from 20 to 30 percent copper is filtered in an American filter.

Production Record

Notwithstanding the slump in the copper market, Frank Hunt's prospect has not fared so badly. During the first ten months of 1937, copper was produced at the rate of 3,000,000 tons monthly. The last two months of the year found the mine turning out but 1,700,000 pounds every 30-day period. Nevertheless, the total for the year amounted to 32,993,769 pounds of the red metal.

Using scratch-paper, pencil and the figures contained in the company's annual report for 1937, one finds that Mountain City Copper produced copper for 7.1 cents a pound, not including depletion or deduction for taxes, making it the lowest-cost underground copper mine, it is said, in the United States.

From the company's report, it is also noted that the net cost of production—including mining, milling, smelting, refining and transportation—was $2,349,684.07.

Of the total gross receipts from ore and concentrates, $2,711,952.93 for the year, the sum of $137,743.88 was paid in Federal income and undistributed profit taxes and $134,608.78 to depreciation. A total of $969,-271.85 in copper, estimated at cost, was held in stock. A dividend of 25 cents a share was paid on 2,371,427 shares of stock outstanding, amounting to $592,631.75.

Benefits from the Discovery

Numerous benefits have accrued to society through the discovery of the Mountain City Copper mine. Homes have been created for several hundred workers and their families. The State

(*Concluded on page 56*)

Looking southwest at Creede mill. Coarse ore bins at top right; crushing and sampling plant, top center; fine ore bins at left; grinding and flotation unit, left center

New Custom Mill at Creede, Colorado

- ***Operating in a Marginal Silver Camp, the Recent Cut in Price of the White Metal Threatened a Shut-Down —Averted by Splendid Cooperative Effort Between All Parties Concerned***

By T. P. CAMPBELL
President
Creede Mills, Inc.

THE first discovery of ore in the Creede district (Mineral County, Colorado) was made late in 1891. By the following summer there were some 15,000 people in the camp and most of the big producers had been established.

In its heyday Creede was one of the last wide-open, rip-roaring camps of the West. Reporting conditions there for one of the Denver papers, Cy Warman was moved to verse:

"It's day all day in the daytime,
And there is no night in Creede."

Since then, however, Creede has been swept by fire twice; the high-grade ore has been pretty well exhausted; and at the bottom of the depression, in 1932, the population had dwindled to 250 rugged individualists. In the meantime, two concentrating mills, the Humphreys and the Amethyst, had been built and operated for varying periods. Both of these mills attempted to recover base-metal and silver values by gravity methods; but the grade of ore declined and recoveries fell below profit limits. By 1915 both mills were shut down and practically abandoned.

Just after the war, and while the price of silver was still above a dollar,

Truck discharging at coarse ore bins

one brief attempt was made to treat the ores of the district by flotation. The attempt was, necessarily, crude and unsatisfactory. Various tests were made to determine the suitability of the ores for cyanidation; but with uniformly unfavorable results.

Brief of District Geology

Creede is essentially a one-metal camp, and that metal is silver. The zone of greatest production lies along the Amethyst fault, the outcrop of which can be traced for miles, running in a general northerly direction just to the west of the valley of Willow Creek, a small tributary of the Rio Grande del Norte.[1] For the purposes of this discussion, it may be stated briefly that the fault occurs in rhyolite; the vein material is chiefly amethyst quartz and gouge; and the values consist mainly of silver, both native and as argentite and horn, associated with small amounts (usually less than 2 percent) of lead, mostly oxidized. A typical sample of ore would show:

Ag	15-25 oz.
Pb	1.4-2.9%
Fe	4.0-7.0%
SiO_2	60-70%
$BaSO_4$	7.5-15.5%
S	1.0-2.2%

The gold content is negligible. It is noteworthy, however, that toward the northern end of the vein the base-metal and gold values increase somewhat. Also, in recent years, developments in the hanging-wall fractures have shown good silver values associated with pyrolusite and a higher lead content than that found in the fault or foot-wall veins. But in no case do values persist at depth; the zone of optimum production has always been between surface and about 800 ft.

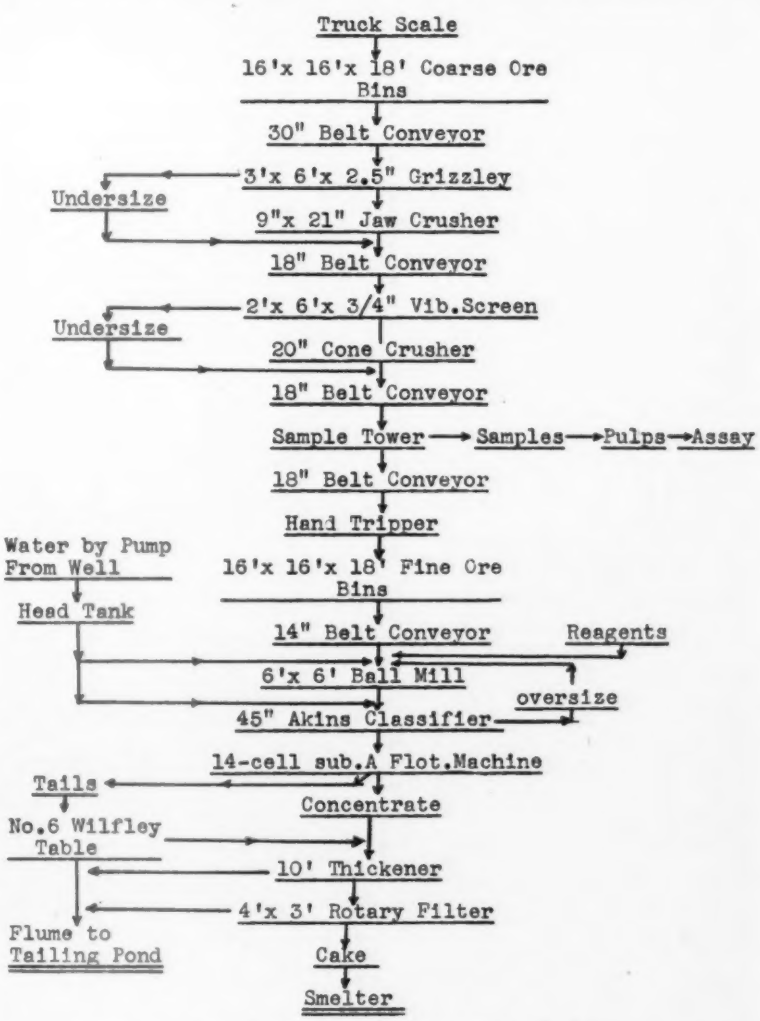
Description of the Mill

Test work for the present venture was started in 1935 by the writer and Mr. Wm. B. Jacobsen. It was quickly ascertained that flotation alone would give commercial recoveries of silver. Cyanidation alone or a combination of cyanidation and flotation, while effecting better recoveries, were too expensive—mostly due to high chemical consumption.

Lack of a satisfactory agreement as to ore purchase terms with the local shippers prevented the erection of a mill at that time, however; and it was not until the summer of 1937 that such an agreement was reached. In the meantime, pilot-plant operations had been carried out at the experimental plant of the Colorado School of Mines and the flowsheet had been well established. Finally the contract was awarded to Edward L. Sweeney, of Denver, and ground was broken on July 20. Since union restrictions did not have to be observed, the mill was completed and in operation by October 17.

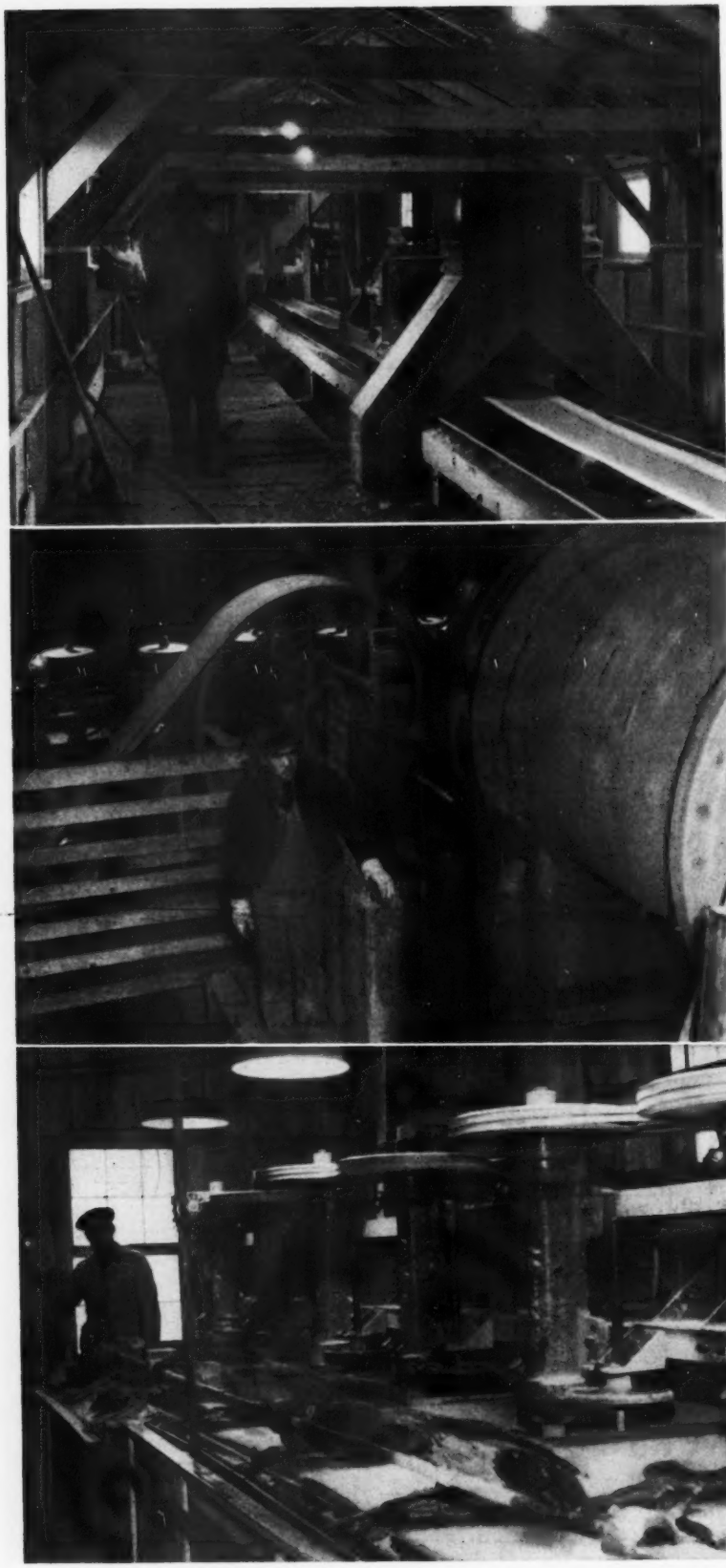
A schematic flow-sheet, showing sizes and capacities of equipment, is given below. Some additional comment and explanation may be pertinent: All ores are delivered by truck and are sampled and assayed in lots of not less than 25 tons each. All crushing and sampling are done in the day shift if possible; but during the winter months bad road conditions have often delayed the trucks and forced the crushing crew to work well into the night.

The sampling plant consists of two chain-and-bucket samplers, each cutting 10:1, and one Vezin sampler, also cutting 10:1. A surge bin, with belt feeder to a set of sample rolls, follows the second chain-and-bucket unit. Three pulps are prepared from the final cut: one for mill assay, one for shipper's comparison, and one for umpire, if necessary. By agreement with the shippers, the following split limits have been established: silver, 0.4 oz.; and lead, 0.4 percent.



Flow sheet of the Creede Mill. Concentration ratio is about 65 to 1

[1] The geology and ore deposits of the district have been described in two U. S. G. S. bulletins: No. 718 (1923), "The Ore Deposits of Creede"; and No. 811b, "Recent Developments at Creede."



Top: Fine ore conveyor and tripper (Jeffrey) over fine ore bins

Center: Drive and discharge end of ball mill. Top of 8-cell Sub A machine at left

Bottom: Cleaner end of 8-cell Sub A flotation machine

Practice, as well as test work, has shown that best operating conditions depend more upon constancy of grinding characteristics than upon values in the material fed to the ball mill. About 40 percent of the ore treated is sorted dump material; this is hard, abrasive and dry. The remainder is made up of newly-mined undergound ore, the grinding characteristics of which vary widely from soft, wet gouge or cave material to hard, dry wall rock. Ore from the mill bins is therefore mixed to produce a ball mill feed which will have nearly uniform grinding time for the desired screen analysis of the classifier product. Roughly, the aim is to produce 15 percent on 100-mesh and not more than 35 percent through 200-mesh. Within these limits the mill can handle about 120 dry tons per 24 hours.

It has been found that optimum grinding conditions, as well as minimum wear on liners and balls, are obtained by setting the classifier somewhat flatter than usual; this results in what might appear to be sloppy classification, but the slime circulating load decreases steel consumption and makes for a more uniform grind. Little or no water is added at the mill, the classifier return being sufficient to maintain a 75 percent solid content in the mill discharge.

Pine oil and aerofloat No. 31 are added at the mill scoop. Originally, one 8-cell sub-A flotation machine was installed; but it was found that this did not allow enough effective flotation time and recently another 6-cell machine of the same type was added. It was then found that the first cells tended to race if sufficient reagents were added at the mill to maintain the froth through the entire bank of 14 cells. Hence, at present a small amount of xanthate (Z8) is being added to the last six cells. Experiments with mixtures of xanthate and oleic acid, for recovery of lead carbonate, have not been encouraging. Such reagents produce a copious froth which, in turn, leads to low ratios of concentration and uneven recoveries.

The pulp overflowing the classifier weir contains about 3.5 parts of water to one of solids. This pulp enters No. 2 cell of the 8-cell machine and flows in cascade through the remaining 12 cells of the two units. A primary froth is taken from cells two and three; this, together with a cleaner froth from the first three cells, constitutes the flotation concentrate. Flotation tailings are passed over a Wilfley table. This serves primarily as a pilot table, but some lead, silver and manganese recovery is also made at this point. The table concentrate goes to the thickener along with the flotation product. The net ratio of concentration is about 65:1.

Tailings Pond, Water and Power Supply

Table tailings pass to a flume and thence to the tailings pond. This comprises a tract of land, some 40 acres in extent, in the "Willow Creek Flats," having excellent drainage and seepage characteristics. By means of a series of low earth dams, and by stacking the fast-settling solids at the upper end of the tract, no difficulty, even in sub-zero weather, has been experienced in avoiding stream pollution.

Water for the mill is obtained from a shallow well sunk in the Flats near the stream. In January the temperature fell to 30° or more below zero on several occasions; but the well did not show any signs of freezing. The mill head tank is equipped with automatic float control, set for 5-ft. difference in head. Water consumption averages about 150 gallons per minute.

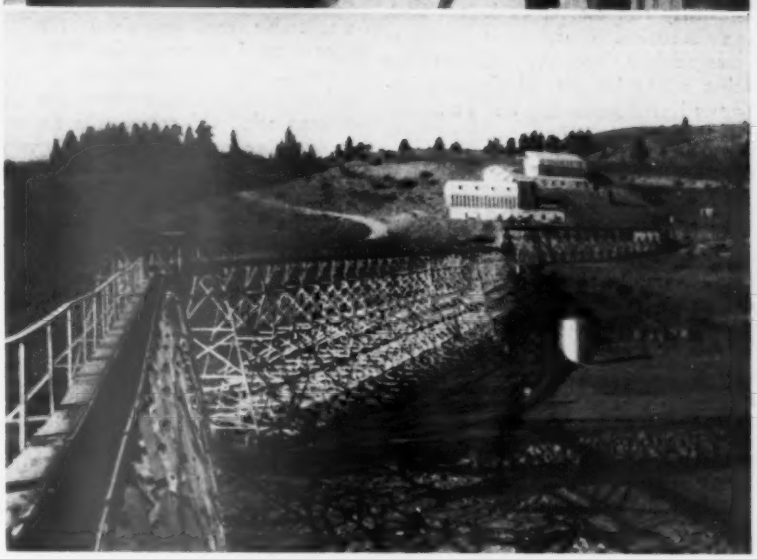
Since there was no adequate supply of custom power in the district, we were forced to put in our own power plant. This consists of an Ingersoll-Rand type S, 350-hp. (sea level) Diesel engine direct-connected to a separately excited 175-kw., 440-volt, 3-phase generator. All machine drives are by individual motors.

A Splendid Cooperative Effort

Ore is purchased outright, under a contract and purchase schedule, from various shippers. When the price of newly-mined domestic silver was cut, on January 1 last, from 77.57 cents to 64.64 cents per fine ounce, it was found that the cost of production was above the new price. A meeting of all concerned was held and as a matter of community interest it was agreed to lower wages, and to reduce transportation and mill treatment charges in proportion. Through this cooperative effort the mill has been able to maintain operations and the mines have been kept open; all of which means steady and direct employment for some 90 men.

The silver situation being what it is, any prediction as to the future of this venture would be fruitless; there are too many variables in the problem. However, in spite of the fulminations of political orators on both sides of the question, there is a growing feeling in the silver-producing States that the white metal is as much entitled to some form of protection as are other metallic, agricultural and animal products. Silver producers are not so much interested in the fine-spun theories of bimetallism and foreign trade as they are in the fact of stabilization of silver prices and the removal of the whole silver question from the sphere of political opportunism. Whether protection comes from an import duty or through Treasury purchases of newly-mined metal at a fixed price is immaterial; expenditures for development, for improvements in equipment, for exploration, cannot well be justified in the present condition of uncertainty.

Power is supplied by this 350 hp. Ingersoll-Rand Diesel engine—generator at far end of unit, with control panel in right background. Wm. B. Jacobsen, mill superintendent, in foreground



Looking west from tailing flume. Fuel oil storage tank, right center. Housed behind this tank are the fuel pump, well and water pump

Better Costs Through Improved Explosives Practice

• ***Difficult Explosives Problems Met by Lehigh Navigation Through Development of New Type Blasting Bomb***

By H. S. GILBERTSON
Director of Research and Personnel
Lehigh Navigation Coal Company

H. S. GILBERTSON

TO A LARGE EXTENT the performance of explosives in anthracite mining and perhaps in other mining fields seems to be taken for granted. Underground supervisory men often have none too keen a perception of the values of the product. They place the main emphasis, quite naturally, on getting out the tonnage. Supervision is difficult; a great deal must be left to the judgment and conscience of the individual coal-cutter. Under the circumstances it is not strange that miners are often allowed whatever amount of powder they deem necessary to get out the work, and that the prevailing powder practices leave much to be desired. The seven-hour day has accentuated this situation by speeding up the general tempo of operation.

And yet explosives affect safety, the rate and volume of production, labor costs and final realization. The mere quantity and cost of explosives used, in themselves, constitute a comparatively minor direct cost. The savings that might be effected through improved practice in any one particular direction are not likely to be spectacular; they may not be exactly measurable, but in the aggregate they are sufficiently promising to warrant intensive study and experimentation.

Particularly is this true in the Southern Anthracite Field in Pennsylvania, where pitching veins and other mining conditions have thus far militated against the practice of undercutting, which would limit the quantities of explosives used or permit the substitution of newer means of breaking down coal, such as compressed air or Cardox.

Losses Resulting from Explosives Use

Most underground men seem to be only vaguely conscious of the fact that explosives not only perform useful work at a very low cost, but also do enormous damage, which is, primarily, another name for losses of prepared yield. But how much is this damage? The circular prices for the domestic sizes range around $6 per ton at the mines. With the normal break-down, the average value of pea and smaller sizes at the mines is about $3. When, therefore, any piece of coal is knocked down, from any cause, into the lower bracket of values, it means loss at the rate of $3 per ton.

A recent Government survey (the validity of which may not be above question) estimates that the polluted water from a group of collieries producing 1,875,400 tons per year of marketable coal contained 260,726 tons of solid matter of plus 100 mesh material. Of this amount, it was estimated that 182,508 tons was 15 percent ash. Of course, the factors determining production of this very fine material were numerous, but it is certainly true that an appreciable direct and indirect cause was excessively heavy shots, which not only produced a large quantity of fine material in the mines, but by breaking up the coal into something smaller than good sized lumps, caused it to become subject to abrasion and breakage in transportation.

Sometimes the importance of the losses of domestic yield are lightly dismissed with the remark that: "There is a greater demand for the smaller sizes, then why not make them in the mines?" A surprising number of intelligent operating men fail to realize that the smaller sizes, popular as they are coming to be, are still only by-products, and that the major burden of the cost of production must still be borne by egg, stove and chestnut.

There has been always much interest in limiting losses in domestic yield through improved breaker practice by the adoption of improved rolls and eliminating drops and sharp corners in the chutes, but recently, Lehigh Navigation Coal Company has sought to evaluate and trace some of the breakage and consequent losses of value to bad explosive practice.

In the Southern Field the pitching veins provide a natural gravity loading system, which necessitates the use of batteries or draw-holes. In second and third mining, coal and rock are often brought down together, thus presenting serious obstacles to the segregation of explosives for the two materials. The system also brings into action in the same area company and contract work, with all the implications of divided responsibility that go with this combination. The company miner is robbed of incentives to economize on materials. There is, consequently, a

likelihood of a great deal of waste of explosives.

Much more important, however, is the likelihood that company powder will be diverted to the uses of the contract miners. Forty percent dynamite, which is intended only for breaking up large lumps at the batteries and in going through slate, gets over into driving work where only the permissibles are supposed to be used. When the miner makes the substitution of free powder it is quite unlikely that he calculates the comparative shattering value of the two explosives. We may assume substitution on a stick-for-stick basis. When this happens, the company loses in three ways: first, the cost of the powder becomes a company cost instead of a charge against the employe; second, the company loses the profit on a corresponding amount of permissibles; and third, the coal is broken down into the smaller sizes. The extent of this diversion can only be estimated, but some individual contract miners have been found to be obtaining 50 percent and more of their requirements from battery starters or other miners on company work.

The damage done by the illicit use of dynamite in regular contract work is indicated by the results of a number of shots fired with an equal bulk of 40 percent ammonia nitrate and "Coalite G" (permissible). Some difficulty was encountered in securing lumps of approximately equal size, shape and hardness, but it is believed that the following result is fairly representative:

The 40 percent dynamite seems to produce about 12 percent more breakage (to pea and smaller) than the permissible powder. Thus, for example, if on a lump of very hard coal a charge of 1/5.3 sticks permissible produces 35 pounds of breakage and the same charge of dynamite produces 39.20 pounds, the loss in value of the product (4.20 pounds) is at the rate of $3 per ton or .0015 per pound and amounts to $.0063. Presumably a full stick would cause 5.3 times as much damage, or about $.03339. Since in a breast there are usually at least three sticks to the hole and about six holes to the cut, the loss from breakage alone might amount to as much as $.60 per cut. On a consumption of 100,000 sticks the breakage loss would be $3,399. The absolute amount of breakage would doubtless vary considerably with degrees of softness or hardness of the coal. This loss, it should be pointed out, is in addition to the cost of giving powder away and the profit lost on the permissible powder which should have been bought.

Car Yield

Even when the higher strength explosive is confined to use at the battery, where it belongs, there is probably excessive breakage there. How much of this breakage is really necessitated by the physical conditions with which the miner must contend is problematical. Too light a shot may not move the mass of hung-up material; and it is desirable that as few shots as possible be fired, in order that production may not be interrupted while powder smoke is clearing. The large lumps directly fired upon undoubtedly run into a huge tonnage, and it would seem desirable that some effort should be made at these points in the mine to preserve values.

But the interest of the operator in lump production does not end with prepared yield. It is, of course, common knowledge that broken up coal or rock occupies about 45 percent more space in the car than a large lump. The best car yield is obtained with a maximum number of lumps, the spaces between which are well filled with sized or fine material. With an ideal combination of sizes in the mine car it is possible to increase car yield by as much as 10 percent.

But, as is the case with other factors in mine production, it is easy to become one-sided in the matter of lumps.

Preparing blasting bomb for placing on roof. Dome-shaped rubber container has inside diameter at open end of about 2½ inches

There is always to be considered the problem of handling in the transportation system and in the breaker.

The Accident Hazard

The extraction of coal through batteries or draw-holes down a pitching chute presents a serious accident hazard from falling material, which is also closely related to explosive practices. In running coal there is a certain amount of mud-capping and occasional block-holing on big lumps. But the common method of placing explosives in the battery is to wedge a cartridge between the lumps by hand. This captures a greater amount of the explosive energy than when only one surface is fired on, but it requires the battery runner frequently to face a mass of rock and coal of doubtful stability. The movement of coal often leaves a cavern which may collapse on slight provocation. A false move may cause the material to run and trap the miner. Accidents of this kind are comparatively frequent and are likely to be serious. Numerous fatalities have occurred over the years in this way.

Blasting Bombs

In attempting to meet the various problems set forth here, Lehigh Navigation Coal Company found them to be more or less inter-related. Basically, the answer seemed to lie in an entirely new method of battery blasting. Some progress might be made by special marking of explosives which would distinguish the dynamite from the permissibles and make it easier for the section foreman to detect the diversion of powder. But this would only facilitate supervision; it would not compel supervision on the part of men who are already rather heavily loaded down with responsibilities. Then there was a thought of providing dynamite in sizes of cartridges too large to be inserted in the regulation sized bore-hole by the miner on contract. This ran into the difficulty of getting from the powder companies a cartridge which would be thick and short; otherwise, there would tend to be a new source of waste with the attendant additional "damage." Neither of these methods seemed to afford any additional safety factor.

It was believed that a concentrated shot which would tend to split rather than shatter the lumps would be decidedly advantageous. In the second place it seemed desirable to widen the opportunity of the battery runner for an effective shot by making it possible

for him to place his charge on steeply inclined or vertical surfaces or even in a hanging position, thus avoiding the necessity, in most cases, of going inside the battery. The theory was that very often a well placed but lighter shot would often get the battery going much more effectively than a heavy charge badly placed. The problem then became that of first changing the shape of the charge, and secondly, of providing a method of placement on vertical or steeply slanting surfaces.

These objectives were reached, in practical experiments, by the use of a dome-shaped or hemispherical container of rubber composition or moisture-proof paper to replace the conventional stick. The unit thus far developed has an inside diameter at the open end of about two and one-half inches and holds the equivalent of one stick of 1¼" x 8" of 40 percent gelatin dynamite. The open end, of course, is placed against the surface to be blasted. In order to furnish a method of attachment, there is provided a thin ring, integral with the hemisphere about one-half inch wide, around the open end, which is set against the surface of the rock or coal. Provision is made in the shell for the insertion of a No. 6 blasting cap just before the shot is placed. The whole unit has the appearance of a small hat.

The next problem to be worked out consisted of finding a suitable adhesive for placing the bomb against the surface. Various glues and rubber cement were tried. All were too expensive, and none of them set quickly. In the end it was found that the best and cheapest adhesive was a very finely divided sticky clay. It so happens that most of the surfaces where the bombs are to be placed are rather wet. By taking a small quantity of clay and daubing it freely on the rim of the bomb, the unit can be pressed against the surface and it will stick instantly and remain in position for an indefinite time. This operation is facilitated by a series of ¼-in. holes around the rim through which, when pressure is applied to the rubber shell, the clay oozes, thus forming a key. The clay also takes up any irregularities in the surface.

The next question to be settled was how to place this bomb without requiring the miner to enter the battery or to face a mass of unstable material. A cup was therefore designed which fits somewhat loosely over the surface of the bomb and is attached to a tamping stick. The connection between the cup and stick is a rubber neck, the flexibility of which permits the operator to place the bomb on the surface from an angle, thus protecting himself against the direct onrush of the material and eliminating the necessity for going into the battery hole. Thus, it is believed, will a considerable portion of the hazard of battery blasting be eliminated.

Shot being placed from safe distance. Bomb holds equivalent of one stick of 40 percent gelatin

Blasting bomb in place on roof. Sticky clay was found to be best adhesive material for fastening shot against surface

The selection of gelatin instead of ammonia nitrate was made because of the plasticity of the material, which facilitates the filling of the shell by the powder companies. While it is conceivable that the gelatin could be removed from the bomb and used in a bore hole, the likelihood of this happening seems very slight, because of the inconvenience of the thing and because the direct handling of gelatin is likely to cause headaches. At the same time, the powder companies claim better fumes for gelatin than for ammonia nitrate.

The shape of the dynamite charge is such as to concentrate the lines of force; that is, it provides a more concentrated and deeper shot than is provided by a stick laid flat against the surface. The result in coal shots seems to be somewhat more of a splitting rather than a shattering effect.

The bomb has been used successfully in several hundred shots in batteries under practical conditions, and has thus far met the approval of the foremen and the miners.

Another use for the bombs is in removing loose top. Apart from barring down, the common method of

Placing shot on high roof. These, of course, must never be used in presence of explosive gases

performing this operation has been to build a "scaffold," bore a hole in the loose piece and fire. This operation usually takes considerable time of more than one man, and is often a dangerous practice, since it requires the men to work directly under the dangerous area. The bomb, on the other hand, can be placed from a point several feet away from the spot, in a fraction of the time required by the traditional method. Bombs have been successfully placed on roofs 13 feet in height. Several bombs placed in a cluster or a row can be put off at one shot by a single blasting cap.

The bomb will add to the direct cost of the shot; the ultimate economy in its use depends on the savings through the safety factor, reduced diversion of company powder, reduced breakage of the coal and saving in time of application.

Of course, the bomb must never be used in the presence of explosive gases, any more than any other form of open shot, unless mud-capped to prevent the emission of flame.

Better Tamping

No discussion of explosive practices is complete without a reference to tamping or stemming. Years ago, when black powder was extensively used, the miner had no alternative; the charge would be wholly ineffective if unconfined. With the introduction of permissible powders and the extensive driving of rock gangways and chutes which call for 60 percent dynamite, the question of tamping has seemingly been relegated to a minor place. Coal miners use tamping in their work, but in many cases it is likely to be very slip-shod and irregular, due very largely to the inaccessibility of good tamping material.

Tamping with mud or coal dirt is a time-consuming process and this, perhaps, more than anything else, accounts for the carelessness in its use which seems to prevail. Among rockmen there is a feeling that high explosives do not need any tamping at all. While it is perfectly true that these explosives work without it, there is undoubtedly a great deal of waste from the fact that the portion of the hole which should be devoted to tamping is given over to an additional charge of explosives. "Gun holes" are more or less common and entail additional labor and expense. It is a common saying in metal mines, I am told, that, "You cannot shoot rock with mud." Anthracite rockmen seem to share this view. Rock contractors, where the contract system is in use, are not overly interested in the matter, either.

The United States Bureau of Mines has demonstrated beyond any doubt in its experimental work that tamping is essential for effective and economical blasting under all conditions, and has shown that a given quantity of explosives greatly increased the efficiency by the use of adequate tamping. This subject is covered in their Technical Bulletin No. 17.

There has been developed in recent years a quick, simple method of sealing by means of a rubber plug equipped with a wooden wedge. This device is inserted in the bore hole in a small fraction of the time required to prepare tamping bags and put them in place. It was originally designed as a safety measure in the case of missed holes. When it is used in the original shot it is no longer necessary to drill a second hole, nor is there any excuse for the rockman to drill out the original tamping. The method employed is to insert a small second charge on the first, and fire. While missed holes have become much less frequent than in former years, due to the improvement in firing devices, nevertheless they do occur with some frequency even yet, and when they do a great deal of time is consumed in correcting them.

The plugs have been making some progress in the anthracite region in coal work, but much greater progress in rock. They are used in large quantities in several of the large water tunnels being driven in New York City and in numerous other smaller jobs. The contractors find that their use materially promotes speed in driving.

The whole question of explosives practice is one to which the anthracite industry should give far greater attention than in the past. It should do its own experimenting and not leave it all to the powder companies.

Alaskan Exploration

Inaugurating the forty-first consecutive season of Geological Survey activities in the territory of Alaska, John C. Reed, geologist, sailed from Seattle early in May for Chicagof Island.

Located in southern Alaska, this island is one of the regions which has contributed to the great mineral output of the northern territory. Since the United States purchased Alaska from Russia in 1867 for $7,200,000, approximately $750,000,000 worth of minerals have been mined there.

Along the Pacific slope of the large and mountainous island stretches a mineral-bearing belt in which are located two relatively large, active mines and several others which in the past have produced significant quantities of gold. Declining to make definite predictions, based on earlier and incomplete reports, Geological Survey experts did say, however, that Chicagof Island holds considerable mineral promise.

Assembling at Ketchikan, one of Alaska's most famous fishing towns, Reed's survey party will include a topographic engineer, J. Mark Holmes, from the Sacramento field office, and a cook to be employed on a temporary basis in Alaska. From Ketchikan the party will travel in a 45-foot chartered launch several hundred miles to the west coast of Chicagof Island. Although the launch will act as a base during most of the proposed five months' work, it is expected that base camps also will be set up at various points in the island as the work progresses.

The Survey party will investigate in detail some of the developed properties and from such detailed work will get information about the localization of the ore deposits which, with the aid of surface mapping, will be a guide to the undeveloped parts of the gold belt.

The nearest town to the Chicagof district is Sitka, about 50 miles south on Baranof Island. Sitka was the Russian capital of Alaska and was well established long before the mushroom tents of the forty-niners lined the muddy streets of San Francisco.

Chicagof and Baranof Islands are only two of the several large islands and thousands of smaller ones that constitute the Alexander Archipelago of southeastern Alaska.

Others from the Washington office of the Geological Survey who will depart soon for Alaska include Gerald Fitzgerald, F. H. Moffitt, T. W. Ranta, J. B. Mertie, Jr., and Philip S. Smith.

Although the survey of Alaska has been in progress for almost 50 years, the vast region now is only about 48 percent topographically mapped and 42 percent geologically mapped.

Preparation of Stoker Coal from Two-Inch Nut and Slack

- ***Surge Bins and Compact Horizontal Screens Found Important in Solving Previous Difficulties***

By GEO. W. CREECH
Assistant Manager
Creech Coal Company, Inc.

TO MEET the demands of its dealers for stoker coal, brought about by the rapidly increasing number of stoker installations, the Creech Coal Company, Twila, Ky., during the summer of 1935 decided to install equipment for the preparation of stoker coal from 2-in. nut and slack.

It was decided to make a ⅜ by 1-in. preparation for which we selected two mechanically vibrated inclined type screens and constructed an additional building for housing them. We endeavored to make this preparation at first by screening out the 1 by 2 in. and ⅜ by 0 in., leaving the ⅜ by 1 in., or stoker coal. Arrangements were made for returning the ⅜ by 0 in. and the 1 by 2 in. to a common discharge point and loading into railroad cars as a modified 2-in. nut and slack. The 2-in. nut and slack was discharged onto the screens at a variable rate of flow as it came from the primary screens. Our experience in efforts along this line proved unsuccessful. We found that too many complaints were being received about the stoker coal on account of excessive amount of included fines.

It was also discovered that a surge bin should have been installed, since the screening equipment purchased did not have sufficient capacity to take care of intermittent surge loads, thereby overloading the screens. This caused inefficient screening since too large a volume of fines entered into the ⅜ by 1-in. stoker preparation and resulted in complaints from the dealer and consumer. These complaints were perhaps not as severe as they might have been if the stoker coal had not been oil treated, thus minimizing the float dust. Complaints were based principally on the coal appearing to contain too many fines.

Surge Bin to Assure Constant Flow

We endeavored to operate through the winter of 1935-1936 with the equipment already installed. However, we realized that it would be necessary to completely redesign the plant. The first consideration would be the use of a surge bin in order to eliminate the highly variable flow of coal as it had been coming from the primary screens. By incorporating a surge bin, we would be assured of a constant flow of coal to the screens and a uniform flow of prepared stoker coal to the oil treating hood at the discharge end of the conveyor that carries the stoker coal to the railroad car. This, we reasoned, would make it possible to make use of a smaller capacity screening unit that would be necessary without the use of the surge bin.

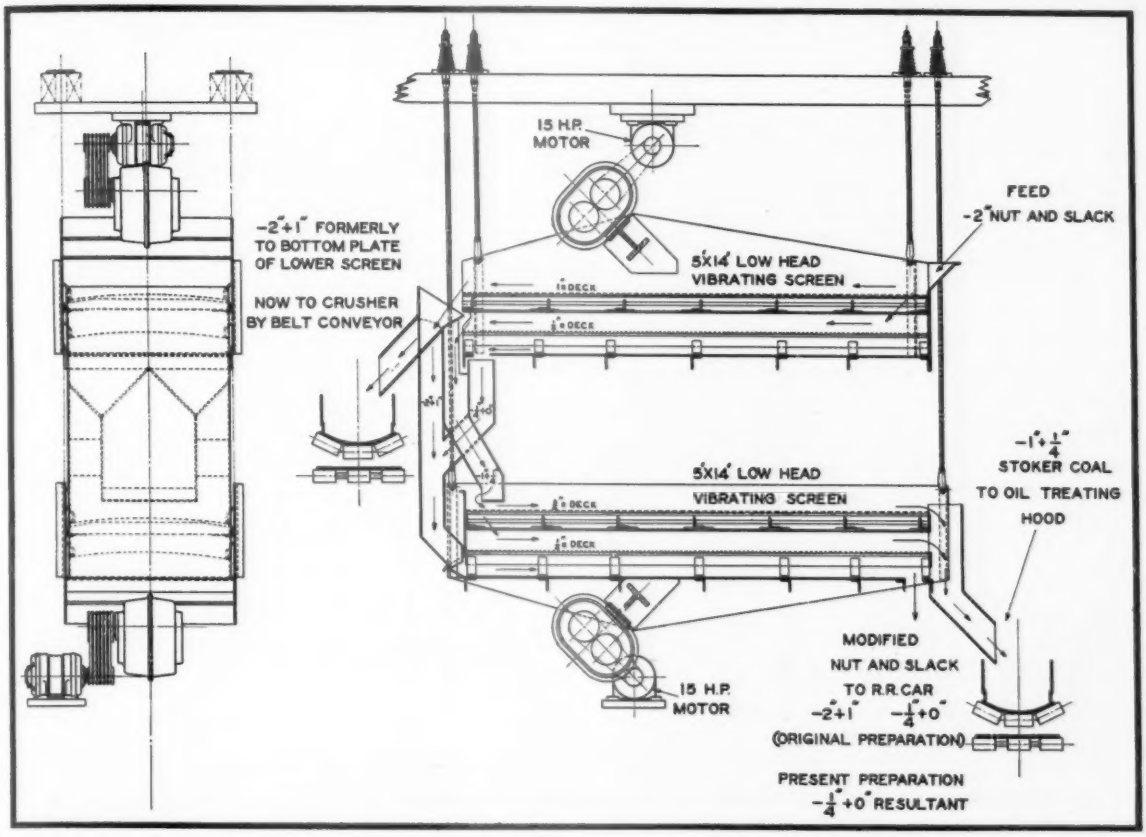
While we were contemplating the redesigning of our plant to include a surge bin, a number of screen tests were conducted. These tests proved that the vibrating screens which had been installed were actually too small to handle the tonnage originally figured. We therefore found it necessary to select larger capacity screening equipment to meet our conditions. This required considerable study, as the new larger screens had to be installed in the existing building.

New Screens Installed

After having considered several different designs and types of vibrating screens, both magnetically and mechanically vibrated, our attention was called to a mechanically vibrated horizontal type of low-head screen manufactured by the Allis-Chalmers Manufacturing Company of Milwaukee, Wis. It was our good fortune to find that this type of horizontal screen could be obtained not only large enough and flexible enough, but could be designed so that it could be readily installed in the structure already built. We installed two 5 by 14 ft. double deck low-head horizontal screens, with bottom plates, for a capacity of 150 tons per hour. These were installed one above the other, and were provided with a unique spouting arrangement, all as shown in the accompanying illustration. This illustration also shows the sizes of openings in the wire cloth used on the respective decks of these two screens.

When these new screens were first installed, we had decided to make a ¼ by 1-in. preparation. The flow of coal over these screens at that time was as follows: The 2-in. nut and slack was discharged onto the top deck of the top screen on which the oversize was screened out. The minus 1 in. fell down on a ¼-in. cloth, and by suitable chute arrangement between the two screens, the minus 1 in. plus ¼ in. was discharged onto the top deck of the lower screen for further screening. The oversize on the top deck of the upper screen (minus 2 in. plus 1 in.) was discharged by a special chute arrangement to the bottom plate of the lower screen.

It will be observed that the top deck of the lower screen receives the minus 1 in. plus ¼ in. for additional screening. The minus ¾ in. screened through the top deck of the lower screen falls on the bottom deck of the



Installation of two 5' x 14' double deck low head vibrating screens with bottom plates at the Creech Coal Co., Twila, Ky.

lower screen which is equipped with ¼ in. square opening cloth for additional screening. The discharge from the top and bottom decks of this lower screen is brought together at the discharge end of the screen so that we have a well-screened minus 1 in. plus ¼ in. preparation discharging onto a belt conveyor for transfer to the railroad car.

Regarding the bottom plate of this lower screen, it will be observed that the 1 by 2 in.-oversize that was screened out on the top deck of the upper screen was discharged to the bottom plate of this lower screen where it was mixed with the resultant ¼ by 0 in. removed by the lower deck of the lower screen. It will also be observed that there is a ¼ by 0 in. resultant coming from the bottom deck of the upper screen. This ¼ by 0 in. resultant was also by-passed to the bottom plate of the lower screen along with the 1 by 2-in. oversize. It is interesting to note that the bottom plate of the lower screen acted as both the conveyor and mixer for the modified 2-in. nut and slack that resulted from the screening arrangement already described.

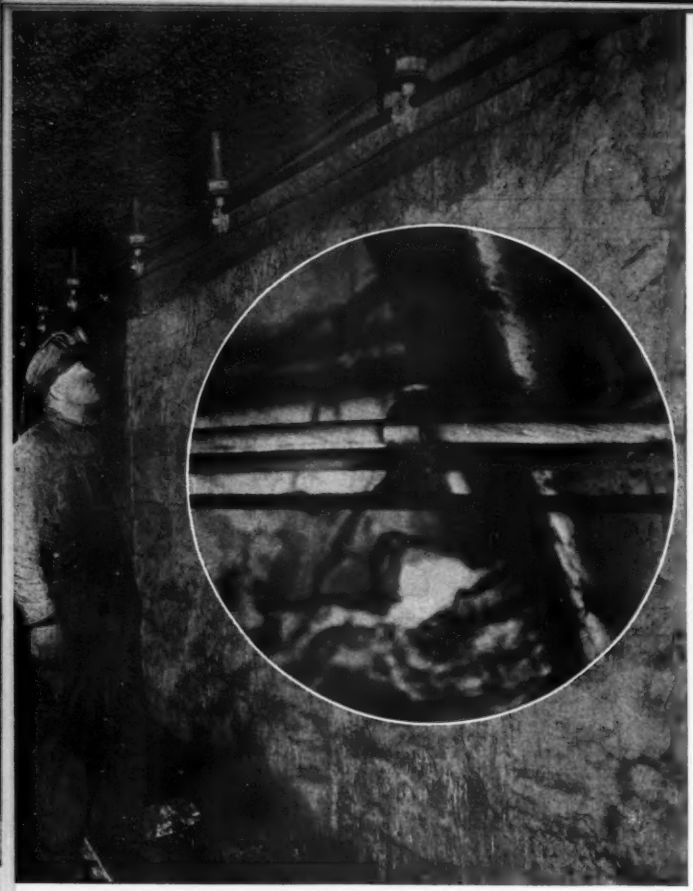
It is further noted that the resultant modified 2-in. nut and slack (minus 2 in. plus 1 in. and minus ¼ in. plus 0 in.) is conveyed to the discharge end of the lower screen and drops directly in a railroad car located below the screens. The stoker preparation (minus 1 in. plus ¼ in.) remaining on the top and second decks of the lower screen discharges on a conveyor that takes it to the oil treating hood.

As previously brought out, the stoker preparation (minus 1 in. plus ¼ in.) was entirely satisfactory; however, after several months' time a number of complaints came in concerning our resultant modified 2-in. nut and slack (minus 2 in. plus 1 in. and minus ¼ in. plus 0 in.) on account of the absence of the intermediate size. We therefore decided to install a crusher for reducing the minus 2 in. plus 1 in. down to 1 in. and install an additional screen. Owing to the satisfactory results obtained from the new screens previously described, a smaller single deck screen —4 by 11 ft.—of the same type was purchased.

With the addition of the new crusher and screen, the minus 2 in. plus 1 in. from the top deck of the upper screen is conveyed to the crusher. Here it is reduced to 1 in. and conveyed to the 4 by 11-ft. low-head screen which removes the minus ¼ in. The minus ¼ in. drops on a belt conveyor and is conveyed to a point below the two large low-head screens where it is discharged into a car with the ¼ in. by 0 in. product from the large screens. The oversize (minus 1 in. plus ¼ in.) from the 4 by 11-ft. screen is discharged onto the same belt conveyor that carries the minus 1 in. plus ¼ in. from the large screens to the oil treating hood.

This screening equipment has been in service for about two years and has given very satisfactory service.

The various points emphasized above, namely (1) the importance of surge bins, (2) the necessity of providing ample screening area, and (3) the advantages gained by selecting compact type screening units, may be of assistance to other operators confronted with similar problems.



A fine example of combination trolley and feeder construction

Low Voltage at Working Face

• *Usually Caused by Inadequate Feeder and Return*

By C. R. KINGSBURY
Engineer
Ohio Brass Company

CASES of low voltage at the working faces of mines are all too common. Questions as to what can be done or must be done to boost this "face voltage" to a reasonable figure are frequently raised.

In most of these cases the working faces are continually progressing farther and farther from the source of power, the substation. The feeder, trolley and bonding, first installed to handle the loads near the substation, are therefore becoming inadequate to handle the load because of the consequent decrease in voltage. This condition continues until the voltage becomes too low to operate the machines at the rated speed. Work is slowed down enormously or armature trouble, due to overload conditions, becomes very frequent.

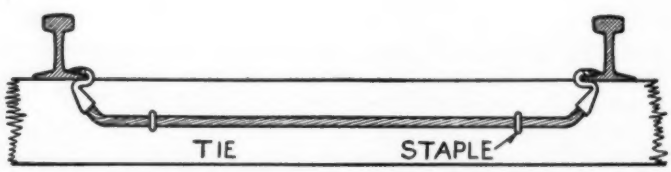
There are two ways of handling this, viz., moving the substation to a point nearer the load center or adding feeder to the positive and negative circuits. Quite frequently both measures are necessary to handle the situation efficiently.

Very often only one rail is bonded, and perhaps the positive circuit has only the 4/0 or 6/0 trolley, and no feeder. Sometimes a 4/0 positive feeder is added and occasionally a negative feeder is laid along on the ground beside the tracks, and still the voltage is not raised appreciably.

A visit to such a mine for a survey of the situation usually discloses that a considerable expense is involved to bring the voltage to the proper level. If the management had increased their copper cross-section as the mine worked deeper they would not need to face this large expense all at one time.

Let us suppose that a mine has only one rail bonded for a particular section, and as a result of low voltage a 4/0 negative feeder has been added. Again assume that 40-lb. rail is in use. A 40-lb. rail has a copper equivalent of 410,000 C.M. at a 12:1 ratio of steel to copper, as compared to the 211,000 C.M. of the added feeder. Thus it would have been far better to bond the other rail and cross-bond at from 200 to 300-ft. intervals instead of installing the 4/0 negative feeder.

The main feature of cross-bonding is often overlooked. That is, with the



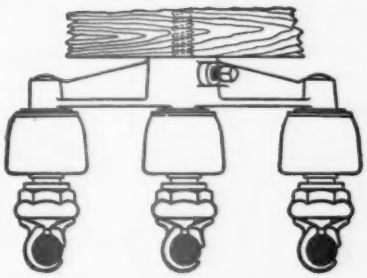
If frequent cross-bonds are used, even though a joint bond should be destroyed, adjacent cross-bonds will tie rails together and assure a proper return circuit. Note method of stapling bond to the tie, out of harm's way

use of frequent cross-bonds, if a joint bond should be destroyed the adjacent cross-bonds tie the two rails together again and the effective resistance of two rails is not lost.

For the positive circuit the small cross-section feeders may be shifted ahead to a section nearer the working face and heavier feeders inserted in this section as the workings proceed away from the substation.

Roof or Wall Best Place for Negative Feeder

When it becomes necessary to add a negative feeder it is best to place this on the roof or wall rather than on the floor. This allows it to be inspected properly and lessens the danger of being cut or broken. Taps should be made to the rail at suitable intervals as in the case of the positive feeder. Very often a negative feeder on the floor becomes covered with scrap and it is almost impossible to trace and find the rail ties, or if it is broken, to find the break. Many times in cleaning the floor of this scrap the negative feeder is cut off or damaged and not reported, and this causes low voltage at the face of the mine and considerable trouble in locating the fault.



An example of heavy feeder installation—necessary for efficient transfer of electric energy long distances from substation to working face

If temporary track is to be laid, it is recommended that temporary bonds be used rather than negative cable on the ground. This is good assurance of a proper negative return for the locomotive operating over this section and a better negative return for the machines at the face of this portion of the mine.

Another important fact that is often overlooked is the size of the wires used to connect pumps, conveyors and other machines to the negative or positive line. Small wire of less than permissible cross-section is very often used. In addition, properly fused taps should be used for conveyors, cable-reel locomotives, and portable machines, such as cutters.

When these precautions are continuously followed, you'll find that "face voltage" deficiencies will disappear. Simultaneously, machine and motor repairs will decrease and mining efficiency will increase.

Boat Trip of Illinois Mining Institute

The final program for the summer meeting and twentieth annual boat trip of the Illinois Mining Institute to be held June 10, 11, and 12 was recently released by B. E. Schonthal, secretary-treasurer.

The steamer *Golden Eagle* leaves at the foot of Vine Street, St. Louis, Mo., on Friday, June 10, at 10.30 p. m., with registration and reception of members and guests preceding the departure.

Morning and afternoon sessions will be held on Saturday, President H. H. Taylor, Jr., leading off with an address of welcome. The subject of "Safety Practices and Accident Prevention from the Point of View of a State Mine Inspector" will be presented by Joseph Firth, Jr., State mine inspector, Benld, Ill.; and a paper on "Caging and Hoisting and Increased Maintenance Due to Speed" will be given by John Abrell, superintendent, Peabody No. 7 mine, Kincaid, Ill.

Papers scheduled for presentation in the afternoon include "Blasting with Permissible Powders," by F. W. Roman, explosives engineer, Hercules Powder Company, Chicago, Ill.; and one on "Dust Treating of Coal," by Lee Hazen, chief chemist, Bell and Zoller Coal and Mining Company, Zeigler, Ill.

The boat is scheduled to return to St. Louis at 8 in the morning on Sunday, June 12.

"Bulldozing" Caused Keen Mt. Disaster

The use of unapproved methods in the firing of a blast was responsible for an explosion in the Keen Mountain mine of the Red Jacket Coal Company at Grundy, Va., on April 22, which resulted in the death of 45 men, according to a preliminary report of the U. S. Bureau of Mines.

Federal, state, and mine officials agree that the serious disaster that occurred at the Keen Mountain mine in Virginia on April 22 was caused by the firing of what is termed a "bulldozing shot" for the purpose of breaking up an accumulation of roof rock which had fallen before the day shift left the mine. The blasting, which was done shortly after the night shift had gone into the mine, ignited coal dust in the immediate area, resulting in an explosion which killed every person in that part of the mine.

"Rock dusting," which is designed to prevent or limit dust explosions, had been done to some extent, but not thoroughly.

The firing of bulldozing shots (those in which no hole is drilled but the explosive is simply laid on the material to be blasted) is recognized as being hazardous in the extreme in coal mines and violates the conditions under which the Bureau of Mines gives its approval for the use of "permissible explosives."

A report dealing with the safe use of permissible explosives, issued by the Bureau of Mines in 1936, warns that bulldozing shots should not be permitted, under any circumstances, in any coal mine, as they are extremely dangerous, even where no explosive gas is present.

Shots of this type should be prohibited, it was emphasized, partly because they are inefficient, but primarily because they ignite gas or dust so readily that even the use of rock dust or other incombustible material over the charge does not insure that degree of safety to which men and mine are entitled. Certainly no shots of this type should ever be fired with the working shift in the mine.

New Partnership Formed

Announcement has been made by Dr. Beram D. Saklatwalla and Mr. Frederick D. Foote of the formation of a partnership of "Saklatwalla and Foote" for the development and promotion of new metals. New York office of the new firm will be in Rockefeller Center, and the Pittsburgh office in the Gulf Building.

With the **COAL DIVISION**

of the **AMERICAN MINING CONGRESS**

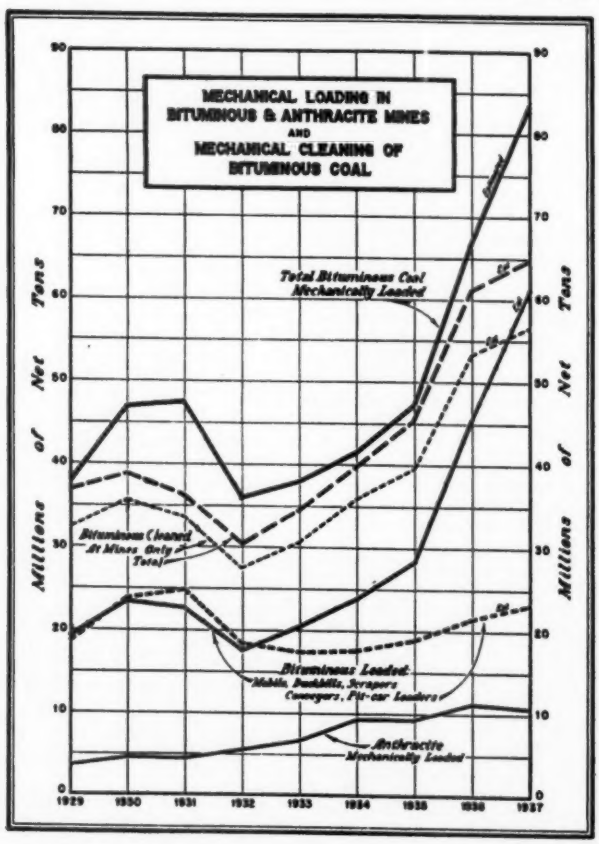
MECHANICAL LOADING and CLEANING in 1936 and 1937*

By L. N. PLEIN
R. L. ANDERSON
J. J. GALLAGHER

MECHANIZATION of loading and cleaning in the American coal mining industry advanced at a rapid rate in 1936 and 1937. During this two-year period the tonnage of mechanically loaded coal increased 77 percent in the bituminous branch of the industry and 13.1 in anthracite. The increases were due in substantial measure to large purchases of mechanized loading equipment in 1936 and 1937. At the same time, the tonnage of mechanically cleaned bituminous coal increased about 44 percent.

It is estimated that 94,000,000 tons of coal were mechanically loaded in American coal mines in 1937. This total compares with 77,981,083 in 1936 and 56,456,281 in 1935. The bituminous mines are largely responsible for this increase, moving upward from 47,177,224 tons in 1935 to 66,961,848 in 1936 and to 83,500,000 in 1937. On the other hand, mechanized loading in the Pennsylvania anthracite region rose from 9,279,057 in 1935 to 11,019,235 in 1936 and then declined to 10,490,728 in 1937, largely as a result of the drop in anthracite production.

In the bituminous fields, Illinois continued to lead in tonnage, followed by West Virginia, Pennsylvania, Indiana, and Wyoming. Large increases in tonnage were reported for West Virginia, Pennsylvania, and Ohio. Although Colorado, Utah, and Washington do not show large tonnage increases, the percentage gains were impressive. It is estimated that the amount of coal loaded by machines in 1937 exceeded 60,000,000 tons,



* The report published here is an extract from statistics compiled by the Bureau of Research and Statistics of the National Bituminous Coal Commission. This report is made possible in part by cooperation of the Works Progress Administration National Research Project on Reemployment Opportunities and Recent Changes in Industrial Techniques. It is published with permission of the Director of the National Research Project. Messrs. Plein, Anderson and Gallagher are members of the Bureau of Research and Statistics, F. G. Tyron, Director.

while the amount handled by conveyors and pit-car loaders was around 23,000,000 tons.

Mechanical Cleaning of Bituminous Coal in 1937

From what is known of new installations of cleaning equipment in 1937, it is estimated that the total quantity of bituminous coal cleaned mechanically in 1937 was at least 65,000,000 tons. This is a substantial increase over the 61,040,539 tons cleaned in 1936. Table 5 gives the tonnages cleaned in 1935 and 1936, based upon final reports from the operators, and estimates for 1937.

The demand for coal in 1937 showed little increase over 1936; hence the gain in tonnage of coal mechanically cleaned was less than in 1936. The 1937 increase of about 4,000,000 tons of coal mechanically cleaned resulted chiefly from the operation of new plants.

A number of the plants installed in 1937, however, were active only a few months of the year, so that the net addition to capacity is greater than the 4,000,000 tons increase in output of clean coal. Including the new plants which came into operation during 1937 and certain others which were due to begin operating early in 1938, the net addition to plant capacity of the known new construction may be placed conservatively at 6,400,000 tons per year.

The new capacity is widely scattered over the country. Over two and one-half million tons of it are in West Virginia, most of this being in the southern portion of the state. Three large plants were constructed in the northern West Virginia fields, where up to the present mechanical cleaning has not been used. About one and one-quarter million tons of the new capacity is found in Illinois. In Pennsylvania the new capacity approaches 1,000,000 tons, more than half of which is in the western part of the state. Indiana contributes one-half million tons of added capacity. Kentucky contributes something less than one-half million tons, the gain being concentrated largely in the western part of the state, which hitherto has given little attention to mechanical cleaning. Kansas and Missouri show a combined increase of half a million tons, which represents both new plants and additions to existing plants. Other states, including Virginia, Alabama, New Mexico, Colorado, and Washington, contribute small increases in capacity.

TABLE 1. - PRELIMINARY ESTIMATE OF MECHANICAL LOADING IN 1937 COMPARED WITH TONNAGES LOADED IN 1935 AND 1936

State	1/ 1935	1936	1937
Bituminous:			
Alabama	1,303,653	1,741,452	2/ 2,100,000
Arkansas	292,064	522,411	2/ 550,000
Colorado	397,319	557,548	3/ 1,018,039
Illinois	20,513,082	26,114,577	4/ 28,344,362
Indiana	5,767,696	7,143,267	5/ 7,426,306
Iowa	—	(6)	(6)
Kentucky	533,250	658,747	3/ 1,300,000
Maryland	(6)	(6)	
Missouri	(6)	—	—
Montana	1,291,373	1,464,121	3/ 1,431,000
New Mexico	(6)	(6)	(6)
North Dakota	(6)	(6)	(6)
Ohio	1,488,303	2,038,315	7/ 3,204,102
Oklahoma	(6)	(6)	(6)
Pennsylvania	6,469,485	9,033,855	8/ 11,951,639
Tennessee	233,579	290,220	3/ 450,000
Utah	898,118	1,358,543	3/ 1,835,000
Virginia	651,807	779,232	3/ 1,500,000
Washington	429,617	609,488	3/ 838,000
West Virginia	2,059,322	8,706,785	9/ 15,490,863
Wyoming	4,530,032	5,189,263	10/ 5,300,000
Undistributed	518,524	754,824	760,689
Total bituminous	47,177,224	66,961 848	83,500,000
Pennsylvania anthracite	9,279,057	12/ 11,019,235	12/ 10,290,728
Grand total	56,456,281	77,981,083	93,990,728

(1) Bureau of Mines, Minerals Yearbook 1937, pp. 832, 887. (2) Estimated on the basis of sales of new equipment in 1937. (3) Thomas Allen, State Inspector of Coal Mines, Colorado. (4) James McSherry, Director, Department of Mines and Minerals, Illinois. (5) Jonas Waffle, Managing Director, Coal Trade Association of Indiana. (6) Included in "Undistributed." Data for 1937 are based largely on telegraphic reports from operators. (7) M. W. Hranilovich, Division of Labor Statistics, Department of Industrial Relations, Ohio. (8) M. J. Hartnedy, Secretary of Mines, Pennsylvania. (9) Telegraphic reports from mine operators. (10) H. P. Rhinehart, Chief, Department of Mines, West Virginia. (11) Hugh McLeod, State Mine Inspector, Wyoming. (12) J. J. Walsh, Deputy Secretary of Mines for Anthracite, Pennsylvania.

TABLE 4. - COMPARISON OF MOBILE LOADERS, SCRAPERS, AND CONVEYORS IN ACTUAL USE IN 1936 WITH SALES REPORTED IN 1937, BY REGIONS

	Mobile loaders		Scrapers		Conveyors 1/	
	In use in 1936	Sales in 1937	In use in 1936	Sales in 1937	In use in 1936	Sales in 1937
BITUMINOUS						
Northern Appalachian States:						
Pennsylvania	92	23	31	—	366	105
Maryland	—	—	—	—		
Ohio	47	28	—	—	18	37
Southern Appalachian States:						
Alabama	10	7	27	5	64	64
Kentucky	5	18	—	—	35	106
Tennessee		1	11	1	21	38
West Virginia	126	73		5	195	275
Virginia	9	8	—	1	70	16
Middle Western States:						
Illinois	431	81	—	—	7	19
Indiana	146	31	—	—		
Trans-Mississippi States	2/ 114	3/ 22	4/ 37	5/ 1	6/ 393	7/ 175
Total bituminous	980	292	106	13	1,169	835
ANTHRACITE						
Pennsylvania	—	—	8/ 483	16	8/ 1,679	260
Grand total	980	292	589	29	2,848	1,095

(1) Includes hand-loaded conveyors and conveyors equipped with duckbills or other self-loading heads. (2) Includes Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming. (3) Includes Arkansas, Montana, Utah, and Wyoming. (4) Includes Arkansas, New Mexico, Oklahoma, and Wyoming. (5) Wyoming. (6) Includes Arkansas, Colorado, Iowa, Montana, Utah, Washington, and Wyoming. (7) Includes Arkansas, Colorado, Iowa, Utah, and Wyoming. (8) Pennsylvania Department of Mines.

TABLE 5. - BITUMINOUS COAL MECHANICALLY CLEANED BY WET AND PNEUMATIC METHODS, 1935-36, WITH ESTIMATE OF COAL CLEANED IN 1937, IN NET TONS OF CLEAN COAL

	1935	1936	Increase, 1936 over 1935		1937 Estimates
			Net tons	Percent	
By wet methods:					
At the mines	31,006,643	42,796,092	+ 11,789,449	+ 38.0	(1)
At central washeries operated by consumers	5,849,845	7,708,499	+ 1,858,654	+ 31.8	(2)
Total wet	36,856,488	50,504,591	+ 13,648,103	+ 37.0	(1)
By pneumatic methods	8,504,533	10,535,948	+ 2,031,415	+ 23.9	(1)
Grand total	45,361,021	61,040,539	+ 15,679,518	+ 34.6	65,000,000

1/ Not separately estimated.

2/ Preliminary estimate, 8,200,000 tons clean coal.

Meeting of the Coal Division of the American Mining Congress

THE Advisory Council and the Board of Governors of the Coal Division of the American Mining Congress held a luncheon meeting at the Netherland Plaza Hotel on Wednesday, May 4, to hear the reports of the project committees and to discuss the further activities of the division.

E. J. Newbaker, vice president of the Berwind White Coal Mining Company and chairman of the Advisory Council of the Coal Division, presided at the meeting, and said:

"It is extremely gratifying to have the evidence of interest in the work of the Coal Division that is shown by the attendance of so many of you here today. I have been coming to the Mining Congress conventions for 15 years, and the contrast between the first convention and the present one tells a remarkable story of evolution and progress that has taken place in coal mining. The change has been slow, but the steps are definite and indicate a serious determination on the part of mining men to have the coal industry meet the competition of other sources of power and retain its position in our national industrial picture.

"The Coal Division of the American Mining Congress has a very definite function to perform in promoting progress and improvements in coal mining, and the things that have already been accomplished by our committees are conclusive proof and assurance that this work will go forward and bring added results in the future. The recognition of the need of unity is why we are here today, and it is quite encouraging to observe these committees, representing as they do all the fields of the United States, working together in a common defense toward a common aim. The committee reports having already brought out information which will stimulate everyone in the industry who plans to go ahead, and as chairman of the Advisory Council, the best thing I have to say to you is to give our blessing and say—go ahead, boys; you are doing a fine job.

"There are several members of the Advisory Council present whom we will ask to express their views and give the committees their advice, but I will first call on Julian D. Conover, secretary of the American Mining Congress."

Mr. Conover briefly outlined the purposes of the Coal Division, and said in part:

"We are having today the first formal meeting of the Advisory Council and the Board of Governors of the Coal Division of the American Mining Congress. As you know, the work in which this division is now engaged was started about three years ago with the organization of our Coal Operators Committees; and the constructive participation of the committee members as well as the interest evidenced by the coal industry in the committee reports led to the formation of the Coal Division as a permanent part of the American Mining Congress. A resume of the progress and present status of the studies being carried on by the project committees will be given later in the meeting today, and we wish to ask for the suggestions and recommendations of the members of the Advisory Council who are present.

"In addition to these committee reports and studies, we believe that the Coal Division should have a further function and should guide the procedure and the program for our annual convention in Cincinnati. It seems to many of us that our future convention programs should have each of these project committees submit what we might term an annual report which would place before the convention the results of the work which has been done by the committees during the preceding year.

"At the suggestion of Mr. R. L. Ireland, Jr., chairman of our National Program Committee, we inaugurated a trial of this plan at our Monday morning convention session by presenting a report of our Haulage Roads Committee with discussions by the committee members. This trial has received so much favorable comment that we are submitting a suggestion that this procedure be repeated by other committees at our convention in 1939. The members of a project committee who represent different fields and who have been working together for a period of several months can certainly bring out and present the best thought developed on that subject, and this method, carefully planned in advance of the convention, can add a most valuable contribution to our future programs."

George B. Harrington, president of the Chicago, Wilmington and Franklin Coal Company, spoke encouragingly of the future of coal and complimented the work of the committees, saying:

"There was an incident that occurred several days ago which will be interesting to those here although it is only connected indirectly with our Coal Division. A few nights ago I attended a railway banquet where the main speaker was the president of the American Locomotive Company. In a very able address he made it very clear to all of us that the steam locomotive is still here to stay and it is able to compete successfully with other fuels in the new railroad developments of streamlining and other things that are now going on. This was decidedly encouraging.

"Coming directly to the work of the Coal Division, I am glad to be a member of the Advisory Council, and at this time the best advice I have to give is to tell you gentlemen on the committees to keep on doing what you are doing, as I believe your work is along the right lines."

R. L. Ireland, Jr., president of the Hanna Coal Company and chairman of the Program Committee, made the following suggestion:

"I would like to make a suggestion for a possible future project. We know that successful mechanization of coal mining requires careful supervision, accurate time studies, and cost analysis, and it would be very helpful to people who are embarking on

mechanization to have something in the form of a guide book, outlining the type of cost accounting that is essential for successful operation. Keeping track of operating costs is very different with mechanized mining than with hand mining, and I believe a study and report by our Coal Division on this subject would be very helpful."

L. E. Young, vice president of the Pittsburgh Coal Company, supplemented Mr. Ireland's suggestion, saying:

"Mr. Ireland has made a very valuable suggestion, as many of us really don't know what our actual mining costs are with mechanized loading. In the experience of our own company in reporting cost data, we have found that as our methods have changed over the past years, it has been extremely difficult to get a true comparison of costs, and it has been necessary to revise accounting methods. In following Mr. Ireland's suggestion, however, I would recommend that instead of trying to reorganize the accounting methods for the entire mine it would be more advisable to confine our study to the operations from the face to the main-line locomotive. To do that much will certainly be a great help, and I think that it is one thing that is worth doing well."

F. A. Jordan, chief engineer of the Youngstown Sheet and Tube Company, submitted the following recommendation as a means for bringing out more floor discussions at the convention sessions:

"I would like to make a suggestion to the Advisory Council and to Mr. Ireland, for a method of getting better floor discussion at our convention next year. As we know, there is some disinclination on the part of many men who attend the convention sessions to make extemporaneous discussions, and it is my thought that this may be largely due to a fear of being quoted. If this is the case, this fear would be removed if no record were kept of the discussions. I am offering as a suggestion that next year we give some consideration to a trial of this method and have one session where there will be no stenographer present to transcribe the remarks offered from the floor. I realize that this will, of course, detract from the value of the written record that is contained in the published Yearbook, but we may, on the other hand, gain the advantage of bringing out more original ideas."

G. B. Southward, mechanization engineer of the American Mining Congress, submitted the following report outlining the activities of the project committees and giving a resume of the present status of their studies.

Luncheon meeting of the Coal Division of the American Mining Congress

REPORT OF COMMITTEES' PROGRESS

At the annual meeting of the Coal Division held in Washington, December 2 and 3, 1937, the Committees met in general conference to hear the project reports. The recommendations of the general conference have been followed since that meeting, and the Committees have made excellent progress on their projects. Following is a brief resume of the present status of the studies under way.

Committee on Coal Mine Haulage Roads

Under the Chairmanship of R. V. Clay, this Committee had made in the latter part of 1937 a series of inspections covering 17 mines in several states, and the following reports based on the inspections were submitted at the December meeting:

(a) Specifications for Main Haulage Ties—A. R. Joyce and Subcommittee.

(b) Ballast and Drainage for Coal Mine Haulage Roads—C. C. Hagenbuch.

(c) Rail and Track Accessories—W. W. Dartnell.

These reports have been published in the MINING CONGRESS JOURNAL. It is the plan to consolidate them with the standard recommendations for frog, switches and turnouts (completed in 1936) and publish them in booklet form for distribution to the coal mining industry.

It has been further proposed that the next study of this Committee will be on Welded Rail Joints. A number of shop tests have been made through the cooperation of the Metal and Thermit Corporation of New York; and it is planned to gather further data on shop and service tests.

Committee on Surface Preparation

This Committee, under the Chairmanship of T. W. Guy, completed a report on "De-Watering Washed Coal" in the latter part of 1937. This has been published in the MINING CONGRESS JOURNAL.

On April 1, 1937, a meeting of this Committee was held in Pittsburgh to discuss further studies. It was decided that the report on De-Watering should be amplified and C. P. Proctor was appointed Chairman of a Subcommittee to add further data and more details.

The study on Coal Screening had already been started and some data had been gathered. At the meeting on April 1 it was decided that before proceeding further with this report a statement should be prepared outlining the various factors that were involved in the selection and operation of coal screens. G. R. Delamater was appointed Chairman of the Subcommittee to prepare this statement.

A data sheet and an outline for the study on Coal Screening, suggested by T. W. Guy was referred back to the Committee for further consideration before adoption.

Committee on Mechanical Loading

This Committee, under the Chairmanship of Newell G. Alford, held a preliminary meeting on December 20 at Pittsburgh. It was decided that

their first study would be to develop a set of standard report forms to be used by operators in keeping daily and monthly performance and cost records. The American Mining Congress was requested to secure sample forms from representative companies as a basis for the Committee study.

On February 28, the Committee again met in Pittsburgh. The sample forms which had been sent in from a number of coal companies were submitted, and in order to expedite this study, the following Subcommittees were appointed:

(a) Subcommittee on Section Reports, under the Chairmanship of E. W. Potter, is to design daily report forms for Section Foremen, and also a form for summarizing the Section Foreman reports.

(b) Subcommittee on Mechanical Reports, under the Chairmanship of S. M. Cassidy, is to design daily report forms for machine maintenance and weekly machine inspection reports.

(c) Subcommittee on Time Study Forms, under the Chairmanship of W. R. Cuthbert, is to design a standard time study form and a form for the time study analysis.

Committee on Conveyor Mining

This Committee, under the Chairmanship of T. F. McCarthy, prepared in 1937 a standard time study form for conveyor mining which is now in use by a number of coal companies. At the December meeting it was decided that their next study would be to develop standard forms for keeping daily production records, and on March 31 a meeting was held in Johnstown, Pa., to get this under way. The following three Subcommittees were appointed:

(a) Subcommittee on Daily Face Reports, under the Chairmanship of L. H. Schnerr, is to prepare two forms: one for single conveyor units, and another for multiple conveyor units.

(b) Subcommittee on Daily Summary of Face Reports, under the Chairmanship of C. P. Brinton, is to prepare a form for consolidating the face reports into a complete daily report.

(c) Subcommittee on Maintenance and Inspection Reports, under the Chairmanship of Ira Fluck, is to prepare a form covering repairs, maintenance and equipment inspection.

The American Mining Congress requested from a number of coal companies sample copies of their forms now in use, and the forms submitted in response to this request have been sent to the Subcommittee members.

Committee on Safety

This Committee, under the Chairmanship of J. J. Sellers, completed in 1937 a set of "Fundamental Safety Rules for Coal Mining." These rules were published in the MINING CONGRESS JOURNAL and were for the purpose of outlining the basic principles governing the safety program undertaken by a coal company.

The study now under way is to develop a set of standard safety operating rules. As a basis for this study representative companies are being asked to furnish copies of their operating rules for the use of the Committee members.

Committee on Power

A report on D. C. Power Distribution Lines was completed in 1936 under the Chairmanship of N. W. Horgan, and a report on Underground Cables was submitted in 1937 by C. E. Wissinger. Both of these reports have been published in the MINING CONGRESS JOURNAL.

This Committee, under the Chairmanship of Carl Lee, is now selecting the subject for their next study. Mr. Lee has submitted an outline covering a number of important phases of underground power for the purpose of getting the opinion of his Committee members as to the next report to be undertaken.

C. C. Ballard, Vice Chairman of the Committee, has prepared a suggested outline for a study on the use of A. C. Power Underground. This proposal merits due consideration as there are many economies to be effected by an extensive use of A. C. power, and a report of this nature should be of great value to the coal industry.

Committee on Mining Systems

This Committee, under the Chairmanship of Frank G. Smith, compiled in 1936 and 1937 a series of reports showing mining systems with hand loading, and dealt particularly with methods of pillar recovery. These reports have been published in the MINING CONGRESS JOURNAL. This Committee is now engaged in a study of mining systems with conveyors—one report has already been prepared and published, and others are under way.

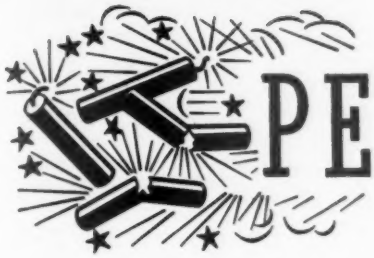
The chairmen of the committees who were present each made a brief statement amplifying the formal report which had just been submitted and explained in some detail how their studies were being made and the plans for the future.

The following members were present: E. B. Agee, *Youngstown Mines Corporation;* Newell G. Alford, *Eavenson, Alford & Auchmuty;* C. C. Ballard, *New River Co.;* W. J. Borries, *Dawson Daylight Coal Co.;* R. V. Clay, *Hanna Coal Co.;* J. J. Coffey, *Bird Coal Co.;* Julian D. Conover, *American Mining Congress;* W. R. Cuthbert, *Pittsburgh Coal Co.;* C. W. Gibbs, *Harwick Coal & Coke Co.;* William E. Goodman, *Goodman Manufacturing Co.;* T. W. Guy, consulting engineer, Charleston, W. Va.; C. C. Hagenbuch, *Hanna Coal Co.;* George B. Harrington, Chicago, *Wilmington & Franklin Coal Co.;* A. W. Hesse, *Buckeye Coal Co.;* O. B. Hewitt, *Gauley Mountain Coal Co.;* E. P. Humphrey, *Stonega Coke & Coal Co.;* H. B. Husband, *C. & O. Fuel Mines;* R. L. Ireland, Jr., *Hanna Coal Co.;* F. A. Jordan, *Youngstown Sheet & Tube Co.;* A. R. Joyce, *Wood Preserving Corporation;* Harry La Viers, *South East Coal Co.;* Carl Lee, *Peabody Coal Co.;* T. F. McCarthy, *Clearfield Bituminous Coal Corp.;* P. D. McMurrer, *American Mining Congress;* R. H. Morris, *Gauley Mountain Coal Co.;* E. J. Newbaker, the *Berwind-White Coal Mining Co.;* J. L. Osler, *Blackwood Coal & Coke Co.;* R. G. Pfahler, the *Berwind-White Coal Mining Co.;* E. W. Potter, *Koppers Coal Co.;* E. R. Price, *Inland Steel Co.;* J. D. Rogers, *Stonega Coke & Coal Co.;* R. E. Salvati, *Island Creek Coal Co.;* J. J. Sellers, *Virginia Iron, Coal & Coke Co.;* F. G. Smith, *Sunday Creek Coal Co.;* G. B. Southward, *American Mining Congress;* K. A. Spencer, *Pittsburg & Midway Coal Co.;* Louis Ware, *United Elec. Coal Cos.;* L. E. Young, *Pittsburgh Coal Co.*

Safe Practices in Wyoming

The annual report of the State Inspector of Coal Mines of Wyoming for the year 1937 states that 4,288,000 tons of coal was produced in that year from rock-dusted mines, or about 72 percent of the total State production. Also, the total coal production of mines using permissible electric lamps amounted to about 4,827,000 tons, which represented 81 percent of the total State production.

Effective May 1, 1938, Safety Mining Company has announced the change of its firm name to Cardox Corporation, with offices at 307 North Michigan Avenue, Chicago, Ill.



PERMISSIBLES

Every child born in Hungary must have a number in addition to its name. . . . and over here we have social security. . . .

■

Senator Donahey of Ohio is acknowleged to be the best whittler in the Congress. . . . He'll have to cut through a forest before he gets at the bottom of the TVA mess he is charged with investigating. . . .

■

Remember how everybody laughed when they saw a picture of President Coolidge pitching hay while dressed in a doublebreasted serge suit. . . . And nowadays you can't be a farmer unless you spend all your time in a business suit, watching your auditor check the AAA forms which prove that you're entitled to money for not farming. . . .

■

The best recipe we've heard for getting this country out of the depression is for Uncle Sam to send the brain trusters out as colonizers of those new little islands we have in the South Pacific. . . .

■

There's some compensation in being poor. . . . A tax expert figures that the $70,000,000 Astor fortune won't quite meet the tax payments when Astor dies. . . .

■

If you didn't know that Jimmy Roosevelt was his father's son you have only to hear him urge big spending as the way back to prosperity to assure yourself he's a chip off the old block. . . .

■

All the politicians are after the dermatologist who announced that he has found a new method of splitting hairs. . . .

Senator Bridges of New Hampshire insists that the last election was nothing but an auction. . . . It's pretty plain, however, that his state and Maine went to the lowest bidder. . . .

After hearing the charges and counter-charges of vote buying that accompanied the Pennsylvania election you can't blame the dictators for laughing at democracy. . . .

■

If you don't think the country has changed in recent years just note with what boredom the average citizen greets the announcement that the President is going to spend three billion or five billion. . . .

■

The Administration has finally admitted that it's a depression instead of a recession. . . . As if it makes much difference to a flat pocketbook! . . .

■

Cleopatra used to carry a subtle poison which had the effect of benumbing her body and making her insensible to pain. . . . Modern day business men have the National Labor Relations Board. . . .

■

Back in 1933, if one wanted to boast in Washington, he would exclaim in a loud voice: "And the President said to me—" . . . In 1938 that same fellow is saying: "And I told the President—" . . .

■

Another big difference between this year and former ones is that Vice President Garner has been telling the President things he formerly kept to himself. . . .

■

It isn't such a bad country after all. . . . You can't buy the Congress, even Mr. Roosevelt found out. . . .

Now they're talking about widening the Panama Canal. . . . A lot better idea would be to widen the Atlantic and Pacific oceans. . . . And think of the employment it would make! . . .

■

The most popular diplomat in Washington these days is the Finnish minister. . . . Maybe some of the other ambassadors would be asked out to dinner too if their countries paid what they owed us. . . .

■

The other day a kite was noticed snarled in a White House tree. . . . Probably that presidential kite that Paul McNutt sent up a little prematurely. . . .

■

Probably there's no connection between those polls which show Cordell Hull as the favorite White House candidate for 1940 and the way in which even stubborn Senators withdrew tax bill amendments which would have interfered with the reciprocal trade agreements program. . . . But in Washington everybody knows there is no surer way to antagonize Mr. Hull than to oppose trade agreements. . . .

■

Washington is puzzled why the Administration turned down the $50,000,000,000 super-highway idea. . . . Now there was a spending program that would warm any New Dealer's heart. . . .

■

Thirty-eight Senators and Congressmen have died in office in the past two and one-half years. . . . And a lot more of them will wish they were dead when they face the voters this summer. . . .

Annual banquet. Inset (left to right): Louis Ware, General Chairman, Committee on Arrangements; E. J. Newbaker, Chairman, Coal Division of the American Mining Congress; Mayor James G. Stewart, of Cincinnati; Thomas Moses, Toastmaster; Howard I. Young, President, the American Mining Congress; and R. L. Ireland, Jr., National Chairman, Program Committee

COAL MARCHES ON!

• *15th Annual Coal Mining Convention and Exposition of the American Mining Congress Highly Successful*

ADVANCE predictions of a rip-roaring success at the 15th Annual Coal Convention and Exposition of the American Mining Congress were completely borne out during the week of May 2-6 at Cincinnati, Ohio. Although the all-time record of 4,777 in attendance in 1937 still stands, the total this year amounted to 4,357, and surpassed the figure for all years other than 1937. This is indeed a tribute to the value attached to the event by the coal industry.

A total of 2,437 coal operators swarmed into Music Hall from all parts of the United States, with Canada, Mexico and England also represented in the registration list, to see the spectacular display of coal mining machinery and supplies, and to hear prominent mine operators discuss subjects of particularly live interest to the coal industry under present day conditions. Reports from all quarters, operators and manufacturers alike, are in complete agreement over the successes achieved at this year's meeting—and many have evinced considerable surprise at the remarkable results, considering particularly the trying economic conditions obtaining at the time.

Such a fine achievement could not have been recorded had it not been for the splendid resourcefulness and cooperative endeavor of R. L. Ireland, Jr., national chairman of the Program Committee, and Louis Ware, general chairman of the Committee on Arrangements, together with all the efficient committeemen working under their able direction. To all these men the coal industry owes a unanimous vote of commendation.

Activities of the week were opened informally Sunday afternoon, May 1, with a cocktail party in honor of Mr. Ireland, to which the various committee members who had contributed so generously of their time and efforts, were invited. Official opening of events was Monday morning, May 2, and activities continued unabated until 1 p. m. Friday, May 6, when the final curtain was rung down, and tired but happily satisfied operators and exhibitors started on their homeward trek.

THE PROGRAM

The convention sessions were formally opened Monday morning at 10 o'clock by Julian D. Conover, Secretary of the American Mining Congress, who, after welcoming all those in attendance, went on to stress the tremendous strides that have been made in modernizing mining methods and equipment in the coal industry during the past 15 years.

In emphasizing this point, he said, "As a matter of fact these 15 years have been marked by more improvements, more development in the entire art of mining coal, than all the preceding history of our industry. When the first of these meetings was held the introduction of mechanical loaders and conveyors had just begun. Today the industry is conscious that machine methods have come to stay, that they are no longer experimental but a recognized and integral part of the modern coal mine. Along with these, as we all know, have come a world of improvements in every other phase of mine operation—cutting, drilling, blasting, transportation and surface preparation. Through the use of power-driven machinery, the coal

mining industry can no longer, even jocularly, be characterized as one requiring merely a strong back and a weak mind. On the contrary, it is taking its rightful place as one of the progressive industries which apply modern American methods in the production of one of our great natural resources."

Mr. Conover also dealt with the advances during the same period in developing a freer exchange of ideas and information on important operating problems. In this connection he said, "Along with this evolution there has been another change which has meant much to the industry. The isolationist barriers which had been built up over many years because of the competitive nature of the industry have gradually been broken down, and today more than ever before you men who come together here are exchanging information, are benefiting by the experience of the other fellow and letting him benefit by yours. This is nowhere better exemplified than in this Convention and Exposition, which culminates the year's work of our Coal Division, and which provides a forum for free discussion and the pooling of information so that the whole industry may progress more rapidly."

R. L. Ireland, Jr., national chairman of the Program Committee, commented on the work of planning a program, pointing out that particular stress had been laid on the desirability of including discussions showing the difficulties that must be considered and overcome before adopting mechanized mining. "The big danger that we have in the coal business today," he said, "is going ahead into a mechanized program without proper preparation. This program that has been designed for this convention has tried to show as far as possible the pitfalls and hurdles that can be and have been successfully overcome, and to point out to those who are embarking on the retooling of their industry what those pitfalls and hurdles are, so that they won't make mistakes but will be able to start right off on a sound basis and get their money's worth out of the very excellent machinery that the manufacturers are building for us today to help us make a success of our industry."

Mr. William E. Goodman, vice president of the Goodman Manufacturing Company, and chairman of the Manufacturers Division of the American Mining Congress, after stressing the appreciation of the manufacturers for the interest shown in attending the Convention and Exposition, went on to point out the tremendous advances that have been made over the earlier conventions and expositions. "This Convention, I am told this morning," Mr. Goodman said, "has a total of 134 exhibitors, which is slightly less than the 144 here a year ago, but in addition we have this year 25 exhibitors who were not here last year; of these 25, 11 exhibitors come for the first time to the American Mining Congress. I think this is encouraging. It evidences an effort on the part of manufacturers and exhibitors to help to solve the problems of the coal industry, and their support of their interest should have beneficial results."

The chairman of the morning session, W. E. E. Koepler, secretary of the Pocahontas Operators Association, in remarking on the number of mining associations who are doing splendid work for the industry, appealed for better correlation of all their activities, thus yielding more effective results.

Haulage Roads and Face Preparation

Mine Haulage Road Construction and Maintenance was the subject of a paper presented by E. H. Jenks, mining engineer, Rochester and Pittsburgh Coal Company, which was based on a report made by the Haulage Roads Committee of the American Mining Congress, which committee personally inspected 17 mines in several states. Different methods of track construction were cited, together with various materials used to meet different conditions and classes of service. "Main line track is purely a railroad problem," he said, "and we can somewhat follow railroading practices, or at least glean a lot from railroad experience. The type of track should depend on the life of the mine and the type of equipment to be used, but to most of us in the coal business, first cost is a very important consideration." After discussing curve construction and the desirability of changing grade by suitable vertical curves rather than abrupt changes, Mr. Jenks went on to discuss weight of rail as follows: "The weight of rail should be selected to suit the equipment to be used; length of life and density of traffic must also be considered. I have found that where we have 20- or 30-ton locomotives and the mine cars are 5-ton gross load, with 4 to 6 trains per hour, we are justified in using 80 lb. rail, though 60 lb. rail could very nicely carry the load, and under such conditions the 60 lb. rail is probably more commonly used than the 80 lb. rail." Size and character of ties and use of welded joints also came in for considerable discussion. He pointed out that the greatest single item in track maintenance is the joint, and laid particular stress on good maintenance of track after it is installed.

H. B. Husband, general manager of fuel mines of the Chesapeake and Ohio Railway Company, pointed out that elevation of the outer rail and widening of the gage on curves is generally left to the track layer, who effects these changes largely by guesswork;

Greeting old friends in the lobby at Music Hall

Opening the Convention Sessions

Left: Julian D. Conover, Secretary, the American Mining Congress

Below (left to right): E. B. Agee, Chairman, Floor Committee; W. E. E. Koepler, Session Chairman; Glenn B. Southward, American Mining Congress; and R. L. Ireland, Jr., National Chairman, Program Committee

also that 60 lb. rail is heavy enough for any and all underground conditions known today. He emphasized further the importance of good ballast, but laid particular stress on the vital necessity of maintaining good drainage.

A. R. Joyce, of the Wood Preserving Corporation, pointed out that the Committee on Haulage Roads had developed standard definitions for ties which are usable and practical, both from the standpoint of the operators and from the standpoint of the timber producers, and urged their general acceptance and use. These tie specifications are available at the Washington office of the American Mining Congress in printed form, and may be had upon written request.

The subject *Methods of Breaking Down Coal at the Face* was presented by C. F. Connelly, general manager, Kemmerer Gem Coal Company, St. Charles, Va., who laid particular stress on two important changes in the coal industry during the past few years that have had an adverse effect upon efficient breaking down of coal at the working face. These comprise (1) the ever-increasing loading rate, with a shorter work day, and (2) the market trend toward the increased use of stoker coal, which has been responsible for the general use of crushing equipment in the tipple. In developing this thought, Mr. Connelly said, "The miner with a high loading rate had a tendency to be less frugal with the use of powder. Besides, he had less time in which to do his work. His careful preparatory work, before blasting, became hurried. He helped matters for himself by overcharging his holes. Discussing shooting with his fellow miners, they came to the conclusion that after all, it didn't make a whole lot of difference any more. Hadn't the coal operator installed one or more crushers in the tipple, which was evidence enough for them that fine coal was the size desired? The machine-runner's work has been likewise affected. The shorter work-day calls for greater speed in his job. Instead of cutting straight ribs, he fell into the easier habit of gripping the ribs. By setting one or two less jacks, he was able to cut a few more places per shift." It was pointed out that this laxity in proper face preparation and blasting had been carried on up to the section foreman and on to the man in charge of operation, and that this condition became constantly worse as the demand for stoker coal increased. He stated emphatically that it was more important now than ever before for every successful operator to get back to real fundamentals as regards the methods he employs in having his coal broken down at the face.

An address on *Factors Affecting Choice of Cutting Bits and Chain Lacing* was presented by W. D. Ingle, Jr., Ingle Coal Company, who indicated that the need for high cutting efficiency and reduction of crushing and grinding of cuttings into fine powder has resulted in numerous experiments with different types of bits. He outlined the problems of bit selection in coal cutting operations of his own company, and indicated that they had switched from the standard 1" x ½" bit to the duplex type that is gaining headway throughout the industry. In describing this bit he stated, "The duplex bits are alloy steel, heat treated at the factory and used only once after treatment. There is no tipping or sharpening to bother about. Both points are used and the small remainder discarded. We manufacture our own at present and find that our total cost per point, including labor, material and cutting wheels, is less than one cent. That is an enormous saving over our cost while using standard bits. The rate and clearance of the duplex bit are constant, as the bits do not bend out of shape." Average life of the bit cutting hard, sulfurous material with frequent boulders in it, is about 4 tons per bit. Mr. Ingle went on to point out that the use of the duplex bit called for use of the duplex type chain, and in this connection he stated, "We have never had one of these duplex chains break. The lugs are constructed so that any wear that occurs may be built up with hard surfacing rod or a self-hardening rod. In this manner they are being kept in shape many times longer than we were able to hold standard bit chains."

Charles Connor, of Nellis Coal Corporation, mentioned the elaborate experimentation being conducted by his company on tipping of bits and chain lacing, and stated that their results to date compare favorably with those

Mr. Ingle had demonstrated. Five different types of chains and two different machines, and about a dozen different kinds of bits are being tested, according to Mr. Connor, forming what is probably one of the most extensive tests on bits and chains and tipping of bits that has ever been made. While these tests have not been concluded, it was expected that within a few weeks very interesting results would be available.

Surface Preparation

All papers presented at the Monday afternoon session dealt with the very important subject *Surface Preparation;* J. B. Morrow, preparation manager for the Pittsburgh Coal Company, and a leading authority on problems of this character, presided at this session.

Methods of Drying Washed Coal was the subject of a very interesting paper by K. R. Bixby, general manager of the Midland Electric Coal Corporation. He strongly emphasized that careful consideration of methods of drying washed coal is necessary on the part of operators "in order to make the proper application to varied conditions—for, at this time, the coal industry is undergoing one of its most serious tests in trying to maintain its position as one of the major industries in the supplying of power and energy throughout the nation. In our attempt to compete with other fuels and forms of energy, it is vital that every phase of the production and preparation of coal be given careful study so that the most efficient and economical methods can be utilized." He emphasized that owing to the very sudden and extensive developments in coal washing, the time has been limited for adaptation or development of the proper drying machinery. Another factor that has slowed down the proper use of drying equipment has been the large initial capital expenditure necessary to equip a plant properly. "The net result is that coal drying is one of the weakest links in our whole preparation process," Mr. Bixby explained. "Our gravest danger lies in the possibility that, in our desire to secure some quick answer to our drying problems, we may select a piece of equipment wholly inadequate and unsuited to our needs." He went on to describe the heat treatment of coal, and the various types of heat driers available, and the uses for which they are designed.

In discussing the paper, T. W. Guy, consulting engineer of Charleston, W. Va., warned that while the consumers' requirements must be met, very careful consideration should be given that no more moisture than is necessary be removed, such unnecessary steps adding to the cost of treatment and deducting from the tonnage being sold.

The subject of *Preparation of Coal by Crushing and Screening* was ably presented by H. F. Hebley, coal preparation engineer, Commercial Testing and Engineering Company. After briefly outlining the modern requirements in coal being prepared for various uses, Mr. Hebley outlined the types of crushing or breaking machinery used in the reduction of lump coal to the requisite sizes, these being classified according to principles adopted for accomplishing the size reduction as follows: (1) crushing due to impact (bar hammer mills or ring type hammer mills); (2) crushing due to rolls (single roll crushers, double roll crushers and multiple roll crushers); (3) breaking due to needling (various types of test breakers); and (4) breaking due to shattering (Bradford type breakers). These various types of machines were then described in some detail, and actual performance records given on each. After a careful analysis of the breaking operation, Mr. Hebley described the various types of screens used to grade the coal for various market requirements, and gave operating results of a number of different kinds. In concluding, the author pleaded for the adoption of rational methods of measuring the efficiency of screening, and a closer study of the product derived from crushing.

W. J. Borries, general manager, Dawson-Daylight Coal Company, emphasized the great desirability of the combustion engineer standardizing the size and preparation of both stoker and special fuels to meet all requirements, thereby reducing the necessity of expensive equipment and expensive cost of preparation.

Chairman Morrow added a number of pertinent remarks concerning the ASTM standard on screen sizing, and pointed out how in England they had been successful in reducing the number of different sizes of coal in one field from about 160 down to only about 7. The latter figure, however, refers to the number of size groups, any particular size coal that was made being required to fall in one of those 7 size groups.

A paper on *Coal Washing, Crushing and Blending* was given by E. C. Carris, charge of Preparation Dept., Island Creek Coal Company, who outlined in detail what is being done at the various plants of the Island Creek Coal Company. Mr. Carris also outlined the personnel necessary for operation and maintenance of a plant, the specified number being 12. In commenting on the type of men needed for running such an operation, he said,

J. B. MORROW
Chairman of the Session on Surface Preparation

"A man with mechanical sense and initiative who has never even seen a piece of coal cleaning apparatus, if properly trained and guided, will develop into the most efficient plant operator. The necessity of good operation, maintenance and cleanliness cannot be over-emphasized. The finest and most efficient piece of apparatus ever constructed and installed will respond poorly in a short time if it is not properly treated. Many a piece of apparatus has been condemned for want of proper operation and maintenance. The results or performance of any plant may be phrased this way, 'As the operation and maintenance go, so go the results.' "

F. A. Jordan, mining engineer, Youngstown Sheet and Tube Company, took issue with some of Carris' views, including (1) his measure of the perfection of washing being determined by the sink lying between the limits of specific gravity 1.40 and 1.70; (2) dewatering plus ¼" coal by heat rather than by mechanical equipment; and (3) that the foreman need not be particularly skilled in the art of washing.

In reply to a question by H. L. Richardson, of the West Kentucky Coal Company, concerning generalized cost figures, Mr. Jordan stated that including the loss of coal charged

against the cleaning operation, probably the minimum cost of any operator would be 15 cents, and that the maximum would not exceed much more than 30 cents.

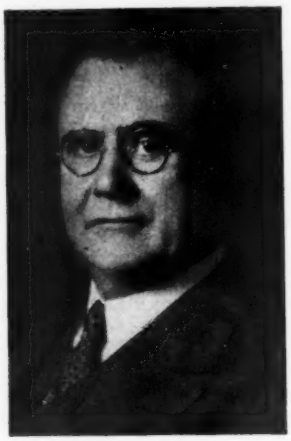
A paper on *Practical Limits of Slate Removal* was presented by D. B. Baird, chief coal inspector, Philadelphia & Reading Coal & Iron Company, who pointed out how the changing consumer demand has brought about entirely new methods of cleaning. Coal cleaning processes in use in 1923, he pointed out, could meet the demand at that time, but the producers of anthracite since that period have been forced to meet more critical demands and greater opposition from other fuels. For this reason, he added, "anthracite preparation has, in many ways, been revolutionized in the last decade or decade and a half, and one of the principal achievements has been in the reduction of slate and other impurities akin thereto generally termed slate by the consumer." Mr. Baird said that in 1931 standards of preparation were changed to meet market demands, and with this change much of the prepared domestic coal, especially in the broken or egg sizes produced at their plant are now practically slate and bone free.

John Griffen, Koppers-Rheolaveur Company, pointed out that there were quite a few in the industry who believe that there is a medium point with reference to cleaning that is the most economical, and that there has been too much tendency to force the ash content down to a point where the benefits to the consumer are not in line with the cost to the producer.

Stripping Problems, Pumping and Haulage

With W. J. Jenkins, president, Consolidated Coal Company, presiding, the papers presented Tuesday morning were concerned with such miscellaneous subjects as *Methods of Strip Mining, Pumping Problems in the Northern Anthracite Field, Developments in Cutting Machine Practice,* and *Haulage Equipment.*

Ira Clemens, president of the Commercial Fuel Company, Pittsburg, Kans., spoke on *New Equipment and Methods in Strip Mining,* in which he first outlined the difficulties encountered and the machinery used in the early days of strip mining, and then went on to describe the modern machinery that has been developed from these earlier types. "The trend in power shovel design has been in the direction of enlarged range and dipper capacities in order that greatly increased depths of overburden may possibly be handled. A quarter of a century ago when the first shovel was introduced in our district, 10 to 1 ratio was considered high," he stated, "whereas today because of the development of large and more efficient shovels, it is now possible to more than double that ratio. Even 25 to 1 is not unusual, which means that with 22 or 24 inches of coal we will, at times, handle up to 50 feet of over-burden." He predicted that in a very short time we would have 50 cubic yard dippers in the stripping industry, emphasized the role of lighter alloys in developing the larger dippers and commented on the importance of truck haulage developments in raising efficiencies of stripping operations.



W. J. JENKINS
Chairman of the Tuesday Morning Session

T. G. Gerow, chief engineer, Truax-Traer Coal Company, added pertinent remarks on (1) recent drilling developments involving the augur and rotary type of drill, the former for overburden, and the latter for rock work; (2) the useful role of draglines and tandem operations in stripping, and (3) importance of accessory stripping equipment units consisting of the tractor bulldozer and the combination tractor and scraper.

A paper on *Underground Water in the Northern Anthracite Field,* by J. F. K. Brown, assistant general manager, and H. H. Otto, mining engineer, both of the Hudson Coal Company, was read by Mr. Otto. He showed how water problems in the anthracite field have become increasingly serious during the past years. Figures were given on the number of gallons per minute pumped to the surface by the Hudson Coal Company from 1920 to 1937, the increase being a steady one, from 33,562 gallons in 1920, to 66,067 gallons in 1937. In commenting on these data, the authors stated, "This table indicates a progressive increase that is astonishing, and we believe will be more or less substantiated by the experience of other companies. Measured in terms of tons of water pumped to tons of coal produced, the figure for 1920 is 8.4; and the 1936 figure is 26.5. Of course such a ratio is affected by the reduction of coal mined as between 1920 and 1936 as well as the water increase, but by the same token that ratio and its growth becomes the yardstick of a steadily increasing mining cost rapidly ascending towards uneconomical limits. The Hudson Coal Company has spent approximately $1,075,-015 in the last ten years in new pumping plants, representing 68,900 gallons per minute of installed capacity. Of the electric power used by the company 40 percent goes for pumping."

Discussion by S. M. Cassidy, Weirton Coal Company, centered about the theme that bituminous coal mines also have a drainage problem to consider, and that although it generally is not nearly as serious as the one outlined by Mr. Otto for anthracite, there is a much smaller cost margin to work with, thus making the problem equally as serious. Difficulty already encountered in maintaining operations in a number of districts in Illinois and Indiana, where numerous abandoned mines have been allowed to fill with water, were also pointed out by Mr. Cassidy.

Newest Developments in Cutting Machine Practice was the subject of a paper by Paul Weir, Mining Engineer, but in Mr. Weir's absence the paper was read by Dr. C. M. Smith, of Mechanization, Inc. After pointing out how the early agreement covering wages and working conditions included work on cutting machines at the old pick mining rate with a so-called machine differential, Mr. Weir pointed out that for a number of years this differential remained the same regardless of improvements and developments in machines. Continuing, he added, "Under these conditions the incentive to both coal operators and manufacturers of cutting machines for improvement was quite small. With the introduction of loading machines and their operation on a day wage basis instead of on a piece work basis, came the operation of cutting machines on a day wage basis. This change in method of payment in mines employing mechanical loading has perhaps furnished the largest incentive for new and better cutting machines.

Additional incentives are selective mining, protection of ribs and props, better quality of coal from a size standpoint, safety, mining of very thin veins, the elimination at the face of bands of impurities, lower cost of maintenance and higher capacity." He outlined what in his opinion have been the most striking developments in cutting machinery, including the Universal trackmounted machine, with its hydraulic operation; the slabbing machine; floor type over-cutter and a floor type intermediate cutter; shortwall machines; and cutter chains. In conclusion he stated, "To the operator, new and improved cutting equipment reduces the cost of production and in some cases makes possible the mining of veins which because of existing natural conditions could not be mined otherwise. With the depletion of the best veins, the inferior must be mined. Manufacturers of cutting machines, when convinced of the sufficiency of the market for new types of machines for special purposes, have proceeded to develop them."

E. J. Christy, chief engineer, Wheeling Township Coal Mining Company, stated that in his opinion there has been more improvement in cutting machine equipment in the last three or four years than was true of the preceding 30 years. He went on to point out the numerous advantages of the cutting and shearing machine as it applies particularly to the peculiar conditions met with in his company's operations in the No. 8 seam in Eastern Ohio.

The subject of *New Features in Haulage Equipment* was covered by three different papers, the first of which was "Automatic Mine Car Couplers," by Peter F. Loftus, consulting engineer, Pittsburgh, Pa. In the absence of Mr. Loftus his paper was read by his associate, Sheldon Smillie. He outlined how the new trend in large steel mine cars is bringing the necessity for automatic couplers to increase operating efficiency and to reduce accidents. Interesting comparisons in accident rates directly due to couplings were made between mines using the old link-and-pin couplers and operations using newer types of automatic couplers. He qualified these direct comparisons by stating, "In most instances, no truly comparable statistics can be secured, because when automatic couplings have been installed other changes also have been made, reducing the frequency of exposure to accident, and consequently reducing the accident rate. On the other hand, increased mechanization has demanded increased speed in car switching and exchange, undoubtedly increasing the ratio of accidents to exposure. However, all operators that were interviewed, who have abandoned the manual coupling, are unanimously in agreement that automatic couplings are desirable from a humanitarian standpoint, and that they return a substantial portion of the new draft gear cost in actual reduction of accident compensation costs." After outlining the desirable features that should be found in automatic couplers, and mentioning briefly numerous practices with reference to coupling and haulage used by various companies, Mr. Loftus outlined the essential features of each of the four tested couplings that are now available.

A description of construction details and operation of hydraulic brakes installed on 125 steel cars at the operation of the Pardee & Curtin Lumber Company was given by E. P. Selby, mine superintendent of that company, in a paper entitled *Hydraulic Brakes on Mine Cars* by F. K. Day, general mine superintendent for Pardee and Curtin, and himself. "As hydraulic brakes are comparatively new on mine cars they will, undoubtedly, be improved," according to the authors. "While the cars at Burgoo Mine No. 4 have been in service but a short time, we think the hydraulic brakes will prove a big improvement over the mechanical brakes, and see no reason why the same idea should not be carried out on mine locomotives. On mine cars their ease of operation, simplicity and compactness, light weight, safety and effectiveness make them desirable."

Improvements in mine locomotives made to bring about adaptability, reliability, accessibility, efficiency in operation and economy in maintenance were outlined by Carl Lee, electrical engineer, Peabody Coal Company, in a paper entitled *Mine Locomotives*. In introducing the subject, Mr. Lee said, "The modern locomotive is a product of evolution in that many changes of smaller details have been made in the course of years, rather than any one general major improvement. Even today those minor improvements are being continued." Enumerating the advances made in improving mine locomotives by manufacturers, Mr. Lee pointed out that controllers are now made with improved blowout coils, removable arc deflectors, hinged arcing chamber, renewable fingers and contact tips; that terminal blocks, cable ducts, rheostats, headlights, brushes, coils, frames, brakes, gears, equalizers, journals, tires and blowers have registered vast changes in the furthering of efficient operation and increased safety.

Conveyor Mining

A symposium on problems pertaining to conveyor mining was held on Tuesday afternoon, with T. F. McCarthy, general superintendent, Clearfield Bituminous Coal Corporation, presiding.

Loading problems that need to be carefully considered by coal operators who intend to install conveyors were outlined by R. G. Pfahler, mining engineer, the Berwind-White Coal Mining Company, in a paper entitled *Problems to Be Considered Before Installing Conveyors*. Difficulties imposed on conveyor mining by seam impurities, varying heights of coal and other physical conditions were outlined, and discussion presented to show how transportation and other underground operation must be adjusted to meet conveyor requirements. "If coal washing facilities are not already available at a mine where conveyor loading is being considered," Mr. Pfahler stated, "perhaps the most important problem will be to determine the probable cleanability of the conveyor loaded coal, how it is to be cleaned, and at what cost in relation to the saving that might otherwise result from conveyor loading. If friable coals are produced that do not require mechanical cleaning when loaded by hand, a correlated problem will be to determine the probable effect of mechanical cleaning on the coarseness of the product. The degradation resulting from cleaning may seriously affect the marketability of the product and can reduce the average return. If cleaning facilities are already available, the lower recovery that may be obtained from conveyor loaded coal will adversely affect costs. The possibility that the coal will not be as effectively cleaned because of changes in the raw plant input cannot be ignored." He cautioned operators that a considerable amount of equipment is necessary for conveyor loading, and that careful consideration should be given to probable cost of maintaining equipment. "An extremely important problem to consider," he emphasized, "is whether there will be sufficient incentive for employes on conveyors to work with the degree of efficiency war-

ranted by the equipment supplied them."

R. L. Wilhelm, superintendent, New Jellico Coal Company, pointed out additional problems to consider as follows: Whether or not shooting is permissible while men are in the mine, since many states have laws prohibiting this practice, and most conveyor installations are based on loading more than one fall of coal per shift; how to handle and dispose of slate or draw rock in entry work; the attitude of labor toward the installation of conveyors; supervision; power supply, and method of delivering supplies to the working face.

T. F. McCARTHY
Chairman of the Session on Conveyor Mining

The system of shaking conveyor mining in the Rock Springs coal field of southwestern Wyoming, and problems of loading and moving conveyor equipment were described by M. A. Sharp, research engineer, the Union Pacific Coal Company, in a paper entitled *Problems in Gathering, Loading and Moving Conveyor Equipment*, which was read in Mr. Sharp's absence by George B. Pryde, vice president, Union Pacific Coal Company, Laying stress on the desirability of trained crews in handling and moving conveyor equipment, he pointed out, "The problems of gathering, loading and moving conveyor equipment are similar to other mechanical mining problems and, to be handled efficiently, they must be approached systematically. The crew accomplishing the move must be trained to work as a unit rather than individuals. Each man must thoroughly understand his duties and how to perform them in the easiest practical way. Ordinarily three or four men and a unit foreman comprise a moving crew, and team work under the supervision of an efficient leader is as important during a move as in the efficient production of coal. A unit which is idle for moving is a dead expense against the cost of coal during the time required to move it to the new location, and the tonnage lost due to unnecessary delay in moving can never be regained. Movements which can be accomplished when the mine is idle, as on idle days, week-ends, or during the off shift where multiple shifts are worked, result in as many more machine shifts of coal per month being gained as machines move. In other words, if a machine is moved during a working shift, the tonnage of that particular shift is lost whereas if it is moved while coal is not being hoisted, it will contribute its usual tonnage to the mine tonnage the following working shift. Considerable foresight is necessary in anticipating a move."

Practices utilized in mining by conveyors and in moving conveyors in the Athens, Hocking, and Perry County fields in Ohio were outlined by C. D. Walker, chief engineer, Sunday Creek Coal Company, in discussing Mr. Sharp's paper. Average time required to move a two-room unit, according to Mr. Walker, has been one seven-hour shift for eight men and one foreman.

Eugene McAuliffe, president of the Union Pacific Coal Company, amplified a number of points that had been mentioned by Mr. Sharp, including early development of the duckbill conveyor, method of setting the machine, and the increased recoveries effected through the use of this type of machine.

Chairman McCarthy stated that multiple shifting is common practice in central Pennsylvania, where he does not know "of any installations that are not double shifted, and most of them are triple shifted."

Detailed figures on length of time required to move different types of conveyor equipment were presented by Mr. Welsh, of the Clearfield Bituminous Coal Corporation, the variation extending from a minimum of 20 man hours for moving a single unit chain conveyor within a room, up to 160 man hours to move a double unit and cross conveyors, including taking headings and back headings, and extracting 4 pillars—2 on each side.

Mr. Richardson, of the West Kentucky Coal Company, added additional comments on the subject, outlining in detail their conveyor loading practice in Western Kentucky, and emphasizing the cleaning problem in connection with conveyor mining.

A. E. Long, of the Clearfield Bituminous Coal Corporation, presented a description of a construction and operation of the McCarthy mobile conveyor. The particular advantages of this type of conveyor, according to Mr. Long, are: Small power consumption, flexibility of operation, low maintenance expense and decidedly less noise during operation at the face.

A non-technical description of the problems involved in getting power to all units of a conveyor installation was given by L. H. Schnerr, division manager, Consolidation Coal Company, in a paper entitled *Power Distribution for Conveyor Installations.* "The main objectives to be considered in power distribution for conveyor installations," Mr. Schnerr said, "are safety, efficiency, and ease of transfer from one set-up to another. The matter of safety is covered by the state mine laws and the company regulations. Efficiency is demanded so that delays are held to a minimum and the maximum tonnage is secured at the lowest production cost. The last item, namely, ease of transfer from one set-up to another, is also important from an efficiency and cost standpoint." Mr. Schnerr recommended the careful consideration of the power installation of conveyor set-ups, and thorough and constant education of the working crews.

H. P. Musser, West Virginia Engineering Company, after outlining the use of central switchboards and terminal boards for power control, discussed mining machine cable for power transmission.

W. C. Chase, general superintendent, Alabama By-Products Corporation, spoke on *Mining Methods in 24-Inch Seams,* in which he described mining systems used, including room and pillar, wide faces and modified longwalls; methods of haulage include both animal and locomotive; methods of loading include hand, scraper, chain flight and shaker conveyors, and mobile loaders — each operator having selected the type of equipment best adapted to his needs. "The problems of producing coal from thin seams," Mr. Chase said, "present many difficulties, particularly where there are numerous rolls and squeezes, and the average of the coal throughout the field is believed to be lower than any other seam worked on as large a scale in this country. The Alabama operators have, by efficient management, been able successfully to operate their mines over a long period of years and through favorable and adverse mining and market conditions."

Mobile Mechanical Loaders

Papers dealing with various problems concerned with mobile mechanical loaders were presented during the Wednesday morning session, with H. H. Taylor, Jr., vice president, Franklin County Coal Corporation, presiding.

Outlining some of the possible problems that may arise when mobile mechanical loaders are installed, D. D. Wilcox, general superintendent, Superior Coal Company, pointed out that plans should include consideration of probable changes with respect to concentration of power, track and haulage, ventilation, drilling and shooting, timbering, cleaning equipment, development, gathering and haulage, and safety. In concluding, Mr. Wilcox stated, "The purpose of this discussion is not to discourage the installation of mobile loading machines, but rather for the purpose of suggesting some possible problems when they are installed. Even the most improved of the loaders are still in the experimental stage, there being much to iron out in every operation. It is best, however, not to be misled by the idea that the purchase of the machine will end all mining problems; by a tale of single day's production, a single day's cost, or a record made in an especially favored part of the mine."

Written discussion of Mr. Wilcox's paper by George A. Schultz, vice president, Liberty Fuel Company, was read by J. H. Edwards, of *Coal Age*. "As for the methods used in advancing mechanization in the various coal fields in the West," Mr. Schultz stated, "there has been too much of the attitude 'John Smith' is making a substantial saving using mobile loaders, therefore we must have mobile loaders; or 'Bill Jones' is doing well with conveyor mining—what he does, we also can do. It is well recognized now that every mine presents its own individual problems, and careful consideration must be given any number of things other than the single phase of loading, if the best results are to be obtained."

Dr. J. J. Rutledge, chief of the Department of Mines of the State of Maryland, commented on the desirability of making provision for adequate ventilation by enlarging entries, and on the matter of recovery in mechanized mining.

How to effect the best cleaning of the coal at the face and to prevent excessive breakage while loading coal with mobile loaders, as worked out at his company's operations, was outlined by Charles B. Baton, vice president, Baton Coal Company, in a paper on *Cleaning and Degradation Problems with Mechanical Loading*. At their Wilson mine, located in the eastern horizon of the Pittsburgh seam, "the results have not reached the point hoped for, but by constant experimentation something has been accomplished," according to Mr. Baton. "With hand loading the percentage of slack averaged 42 percent. When the loading machines were first installed this percentage jumped to 55 percent. After 1½ years operation the percentage is now 46 percent. The percentage of ash has also been greatly reduced during the period that the machines have been in use. We hope to improve still further both of these factors." He outlined the methods that have been used to clean and prevent degradation of the coal, including proper handling of the following phases of operation: timbering, drilling, shooting, projection plans for mining and slate picking at the face.

A detailed description of how the Arkwright Coal Company meets the cleaning and degradation problem without the use of a cleaning plant was outlined by E. D. Gall, superintendent of that company.

Transportation problems with mobile loading should be approached from three standpoints, according to J. W. Woomer, chief mining engineer, Hanna Coal Company of Ohio, in reading a paper on *Transportation Problems with Mechanical Loading*. These include (1) consideration of maximum safety, (2) minimum investment and operating costs, and (3) the keeping of cars at loading point. General problems that are common to both main haulage and relay service haulage are concerned with mine cars, track, power consumption, and transportation equipment maintenance. Specific problems dealing with main haulage and relay service haulage was outlined, followed by brief discussions of conveyor, animal, storage battery locomotive and pneumatic haulage. In concluding his paper, Mr. Woomer stated, "Men who have watched mechanical loading units for any period of time are unanimous in agreeing that good transportation men can make or break any loading machine made. Good transportation men can make records for loading machine operators and the best operators in the business, if serviced by poor motormen and poor brakemen, become mediocre or poor immediately. To attempt to set down dogmatic solutions to transportation problems that would apply to all the economic and geologic peculiarities of the entire coal industry would be folly. This paper has given no answer; it is but an exposition of those problems that some have met and more will be forced to meet when they arrive at that point when somebody says 'let's put in loading machines.'"

H. H. TAYLOR, JR.
Chairman of the Session on Mobile Mechanical Loaders

Andrew Moffet, Consolidated Coal Company, laid particular stress on rubber-tired haulage, and outlined in detail his experience with such units in the Illinois field.

Laying great emphasis on the importance of management, William Cunningham, superintendent, Linton-Summit Coal Company, spoke on *Problems in Mining Thin Seams with Mechanical Loading*. Problems of haulage and machine maintenance are important considerations in mining seams of 4 to 5 ft. thickness with mobile mechanical loaders, according to Mr. Cunningham. He stressed the importance of analyzing operating conditions before installing such equipment. He also laid particular emphasis on the matter of selecting the proper type of mechanical equipment, and in this connection, stated, "The selection of the proper type of mechanical equipment is of the utmost importance. It is my belief that most mining men do not spend enough time investigating the various types of equipment before arriving at decisions. Once the equipment is bought and installed there isn't much that can be done except to go ahead and use it, even though a mistake has been made in the original selection. The final decision should not be made until after all possible types are seen in operation

under mining conditions as similar to your own as it is possible to find. Careful study should be made of the advantage of each type of loading and cutting machines when applied to your conditions. The loading machine must be applied to the mine rather than the mine to the loading machine."

Safety

With J. J. Sellers, vice president of the Virginia Iron Coal and Coke Company and chairman of the Project Committee of the American Mining Congress on Safety, presiding, the Wednesday afternoon session was devoted entirely to a thorough airing of the important problems concerning safety in mining.

Methods used with appreciable success by the Bell and Zoller Coal and Mining Company in the training of its employes in accident prevention work were outlined by John Lyons, safety engineer of Bell and Zoller, who, after a study of accidents at the company's mines, pointed out that training in accident prevention was needed along two lines: the training of foremen, and the training of other employes. In describing the training of foremen, he stated, "In order to make them 'safety conscious,' they should be taught that they have, in some parts, a responsibility for every accident that occurs to any employe under their supervision." Mine foremen of the company are required to follow closely the safety standards of the company and to be familiar with and enforce safety rules. In speaking of the training of employes other than foremen, he spoke highly of results obtained through the Bureau of Mines 100 percent first-aid training classes. In conclusion he said, "I believe firmly that the degree of success obtained by any company in promoting a safety campaign over an extended period depends entirely upon the combined efforts of the supervisors and the executives. Interest in the campaign must be maintained and occasionally revived through new ideas presented to the employe. A let-down on the part of the executives will be directly reflected in the results obtained by the local supervisors in daily contact with the men. Keeping the safety program constantly alive can be compared with an advertising campaign. The same thing must be presented in numerous ways and at each presentation must be so phrased as to command renewed attention."

J. J. SELLERS
Chairman of the Session on Safety

W. N. Wetzel, general superintendent, United States Fuel Company, outlined in considerable detail the practices used by his company in promoting safety.

Eugene McAuliffe, president of the Union Pacific Coal Company, presented interesting comments describing the many different approaches that have been made by his company in development of an effective safety program, the best results having been obtained since 1931 when the practice of awarding prizes through the medium of a lottery was first used in their safety work.

The major factors to be taken into consideration in reducing mine haulage and machine accidents are the human and material elements, according to David W. Jones, superintendent, Princeton Mining Company, who spoke on *Reducing Haulage and Machine Accidents.* After cautioning operators to see that the design of the rolling equipment is made for safe operation and that the mine roadway, ribs and roofs are maintained in condition to prevent accidents, Mr. Jones emphasized the use of means to make the men safety-conscious. Encouraging safety training plans he stated, "First-aid training classes provide the vehicle for discussion along safety lines and should be encouraged. Regular safety meetings and gatherings are essential for presenting safety ideas. Unfortunately, it usually is necessary to encourage attendance by some means of bank night awards. Joseph A. Holmes Safety Association meetings held once each month are a sure means of conducting safety along organized and planned lines of procedure. . . . In the final analysis, to reduce haulage and machine accidents, men must be made safety conscious and kept that way by safety suggestions and education. It is equally essential that the equipment and machines the men operate and live with must be built along lines suggesting safety. Then each individual will feel that he will be the one responsible if an accident occurs."

William Lauder, assistant production manager, Pittsburgh Coal Company, enumerated 16 of the principal causes of haulage accidents, and pointed out the methods of removing the aforementioned causes in effecting a reduction in accidents. In concluding his remarks, Mr. Lauder stated, "Assuming that ample supervision of the highest type has been provided, and that men for all positions or occupations have been carefully selected and trained, we must then make a personal checkup on ourselves to see that no unsafe practices observed or drawn to our attention are allowed to continue. The whole problem of reducing accidents on haulage and machines is given sufficient foresight and thought toward observing the possibilities of an accident, then applying a prevention before it is too late. Do not ignore common sense safety precautions."

Before selling safety contests to the workmen, management must first be thoroughly sold on a safety campaign and by example demonstrate their interest in it, according to C. E. Young, personnel manager, Wheeling Township Coal Mining Company, in presenting a paper entitled *Intra-Company Safety Contests.* "In other words," he said, "they must realize and accept the responsibility of protecting the workmen by: (1) having a sincere interest in safety, (2) by providing safe machines, (3) by an active campaign against carelessness, (4) by arousing the employes' interest in working safely, and (5) by making supervision directly responsible for those people working under them. Then safety contests can be used to advantage." Contests most commonly used today, he said, include the national, the lottery, the state, intercompany and inter-department.

A motion picture made by the Koppers Company for safety education purposes was shown by C. R. Stahl, division superintendent of that company, who explained that the pictures are particularly effective because the scenes and actors are all local. Their people are interested because they recognize the scenes and are themselves the actors. The pictures follow one general pattern: The rule is shown first, then scenes are made showing

the right way and the wrong way. Finally a short drama is shown which illustrates causes and effects, and this drama makes an effective ending of the subject. Titles and script are lettered free-hand on a small scale, and enlarged by taking close shots. At times, according to Mr. Stahl, it is possible to reenact severe accidents which have happened, and include them in a standard film; this procedure is particularly effective.

Maintenance, Power and Ventilation

With Albert Gately, general superintendent, Republic Coal Company, presiding, papers presented on Thursday morning dealt with a variety of subjects, including maintenance, power, shaft sinking, and ventilation.

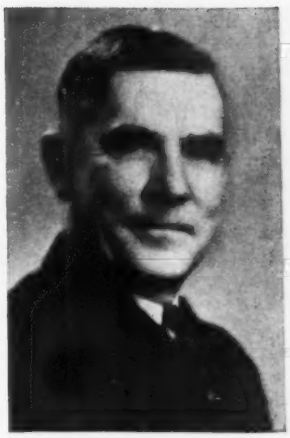
"Maintenance work is preventative," said E. A. Rickard, chief electrician, Koppers Coal Company, in presenting a paper on *Equipment Repairs and Shop Practice.* "It is based on the theory that it is better to 'keep out of trouble' than 'to get out of trouble.'" He outlined important factors to consider in maintenance of electrical apparatus, ball or roller bearings, and commutators. Value of adequate lubrication and proper sealing of bearing housings were particularly emphasized. "In conclusion," Mr. Rickard stated, "I want the operators, the mine superintendents, and the mine foremen and others interested to know that systematic schedules of supervision, inspection and repairs to mining equipment aids very materially in reducing breakdowns, lower maintenance, and in producing a better cooperative spirit among the organization. Yet good maintenance includes attention to small as well as large parts, the use of good insulating material, systematic inspection and the inspiration, ability, and perseverence to 'keep performing.'"

W. E. Wolfe, electrical-mechanical supervisor, Clinchfield Coal Corporation, after pointing out the growing importance of maintenance in mines due to increased mechanization, strongly advocated a systematic program of maintenance inspection, since "an ounce of prevention is worth a pound of cure."

Underground Power Distribution was the subject of a paper presented by C. C. Ballard, master mechanic, the New River Company, who pointed out how the operating cost of mining is reduced by proper power distribution. He described how voltage drop and power loss may be reduced through proper installation, and laid particular emphasis on proper attention to the negative circuit, better known around the mines as the return circuit. In this connection, he stated that he had known it to be called "the forgotten circuit." "Rail bonds are an item that is familiar to everyone in the operating department of a coal mine," he said, "and they are important since they are connecting links in the electrical circuit. Any breakdown in this link such as poor installation of bonds correctly chosen or the selection of bonds of improper size, length, or type is directly reflected in the cost of power per ton of coal produced. Often this fact is not fully appreciated."

The underground high-voltage system used at the Talleydale mine of the Snow Hill Coal Corporation was described by Andrew Hyslop, chief engineer of that company.

Presenting a paper on *Shaft Sinking Methods in Alabama,* Percy G. Cowin, of Salmon and Cowin, Inc., pointed out that inasmuch as most of the beds of coal and iron ore occurring in Alabama outcrop on the sides of the valleys, and dip under the heavy cover of the hills, most, but not all, of the shaft sinking has been done for ventilation purposes after the mines have been opened up and developed by slopes from the outcrop to a point where more air is needed at the working faces. "These openings and headings driven on the slope and into the basins, however, have been extended to such lengths that it is undoubtedly necessary now, and will be increasingly so, to put down shafts to hoist coal and iron ore from nearer the working faces. Many of these slopes extend into the basin for 3 or 4 miles, and faults add further handicaps to haulage and to the circulation of air." Mr. Cowin described a number of typical shafts with the construction of which he had been connected, and described in considerable detail one that was sunk at Lookout Mountain, near Chattanooga, Tenn., in which grouting was resorted to in order that heavy flow of water be eliminated or greatly minimized. Safety and economy in shaft sinking rather than excessive progress were stressed by Mr. Cowin throughout his address, and in explaining the reason for emphasis on these two items, he said: "The urgency for early completion of a shaft job usually may be charged to failure to plan far enough ahead in the operation for development of a mine. If speed is to be the first consideration, safety and cost will be secondary. Long-range planning of mining operations will anticipate the need of most shafts, result in a proper balance between economy and speed, and effect a worth-while saving in money and safety."



ALBERT GATELY
Chairman of the Thursday Morning Session

A paper on *Shaft Sinking Methods in Colorado,* by Fred Nesbit, vice president, Boulder Valley Coal Company, was read in his absence by T. E. Jenkins, president, National Fuel Company. Nesbit's presentation was centered about a detailed description of the actual sinking of the operating and ventilating shafts at the new Centennial Mine of the Boulder Valley Coal Company, in northern Colorado.

Modern Ventilating Installations was the subject of a paper presented by William Norris, Jr., safety director, Carter Coal Company, in which he described the installation of a propeller type fan in the Olga No. 2 mine of the Carter Coal Company, which now operates in parallel with an older centrifugal-type fan. Detailed figures on volume of air produced and of power consumed were included.

Management and Supervision

The final session of the meeting on Thursday afternoon was devoted entirely to problems pertaining to management and supervision, at which D. H. Pape, president, Sheridan-Wyoming Coal Company, presided.

Successful Adjustment Between Management and Employes was the subject of an address by J. R. Sharp, director of public relations, Philadelphia & Reading Coal & Iron Company, who described in considerable detail the procedure and experiences of the

conciliation board which has been functioning successfully for the past 35 years in the anthracite field. In describing the functioning of the board, he stated: "Hearings of grievances are held separately in each of the three districts at the request of either party to the contract who may have a grievance or an alleged violation of the contract. Both the complainants and the respondents are permitted to call witnesses and submit testimony and exhibits. The testimony is taken verbatim by a stenographer, which testimony is later transcribed and copies given to the two board members hearing the grievance in their respective district, together with copies of all exhibits. The conciliators in each separate district may and often do agree upon a settlement or adjustment either before or after the hearings, which is then made a matter of record for the board. Each grievance is given a consecutive number, and some idea of the work covered by the board may be gathered by stating that to date more than 5,300 numbered grievances are a matter of record." Mr. Sharp emphasized that grievances once heard and ruled upon cannot be reopened, nor a similar one heard. Summarizing the administration of the board in settling grievances, he said: "The decisions of the umpire and the board are, of course, not always received without some criticism, but they are obeyed by both parties to the contract. As the board has functioned amicably in the main for some 35 years—its rulings governing complaints for more than 100,000 employes—it is without parallel the most satisfactory set-up for handling of labor troubles that is in existence today." About 65 percent of cases heard by the board go to the umpire.

Mr. James Hyslop, of Walter Bledsoe & Company, asked about general satisfaction or dissatisfaction with decisions that have been rendered by the umpire, and went on to comment upon the results obtained from a somewhat similar set-up in Indiana. The umpire for the anthracite board is appointed by the court, whereas the umpire for decisions under the Indiana set-up is selected by the operators and miners.

"The subject of personnel training is so closely allied to safety work in the mining industry that it is very difficult to speak of one without alluding to the other," said A. D. Sisk, safety director, Big Sandy-Elkhorn Coal Operators Association, who presented a paper entitled *Personnel Training*. Under modern mining conditions the industry has need for safe, skilled workmen more than ever before, and facilities for training such men have not kept pace with the changing conditions, according to Mr. Sisk. The short working day necessitates speeding up operations, and skilled workmen are essential for modern mining. "From both the standpoints of safety and efficiency," Mr. Sisk stated, "it is plainly evident that the effectiveness of man power so necessary in the production of coal has not progressed in keeping with the improvements in equipment and methods. We are never satisfied with the equipment and methods now in use and keep continually changing and improving them. This same motive should impress upon us the very urgent need for the improvement of the workers, and the coal industry should take the necessary steps to bring human efficiency up to a parity with the other phases of mining. A good program of personnel training at all levels of jobs from the superintendent down to the men performing the most menial task is the answer to a great many problems."

Successes of the Procter and Gamble Company in personnel administration were outlined by Stewart M. Lowry, director, industrial relations, of that company, in a paper entitled *Personnel Relations*. He outlined in considerable detail the provisions of their oldest so-called employe relation plan—the Profit Sharing Plan—which was introduced 51 years ago, and mentioned other plans that have been added in succeeding years to provide for sickness and death benefits, retirement pensions, and vacations with pay. What is considered as the most important of all their plans—the Guarantee of Regular Employment—was put into effect in 1923. This is a very simple plan as far as the employes are concerned, according to Mr. Lowry, and may be stated essentially as "we guarantee full-time work for not less than 48 weeks each year." New employes are not eligible for this guarantee immediately after they come to work; they must first prove their desire of becoming a permanent employe by working a probationary period varying from six months to two years.

In closing, Mr. Lowry quoted from a recent address by Mr. Deupree, president of the company, as follows:

"Although, in the light of our experience, good industrial relations are not burdensome, they do demand a great deal from the management of the company in the way of effort, forethought, and aptitude for the task. Their success springs from a genuine desire to be helpful to our fellow man, and only those who have the proper qualifications seem to be able to bring them easily into effect. Those who bring the greatest ability to bear on the development of good employe relations are socially-minded, economically-minded, politically-minded, and religious. And of these attributes, a deep religious conviction of the worthwhileness of the effort is the most important. Without it, the other qualifications lose much of their motivation and do not carry the conviction of sincerity. For employes must realize the sincerity of the employer or his efforts will fail to win the cooperation on their part that is so necessary to put a sound plan into effect. Good employe relations are a development from both sides. They are not something which can be imposed by an edict from the Board of Directors."

In commenting on Mr. Lowry's address, Chairman Pape pointed out that while it is possible for industries such as Procter and Gamble and many others who have a steady profit earning over a long period of years to effectuate such plans, the coal industry, by and large, has operated at a loss during the past 10 years, and such conditions make it exceedingly difficult to carry out plans of this nature.

L. E. Young, vice president, Pittsburgh Coal Company, elaborated on general conditions of the coal industry in connection with the development of such plans, and concluded by saying: "As far as I am concerned, I think that we can renew our faith from the statement made here this afternoon. Procter and Gamble has done it. Others have done it. Soap has done it. I hope and pray that coal may do it some day. May the day come soon, and as I listen to the roar of our machinery and see all the things in the hall, I have the hope and the vision that somehow or other we are going to rehabilitate through mechanization."

Board of Directors Luncheon

The luncheon meeting of the Board of Directors of the American Mining Congress was held from 1 to 2.30 p. m., Thursday, May 5, and in addition to members of the board the meeting was attended by a large number of executives and operating men of the coal industry and representatives of the Manufacturers' Division.

President Howard I. Young pre-

sided, and the meeting received the reports of Erle V. Daveler, chairman of the finance committee; Henry B. Fernald, chairman of the executive tax committee; Herbert Wilson Smith, chairman of the committee on social security; Samuel H. Dolbear, chairman of the committee for cooperation with the Securities and Exchange Commission; and a full report from the secretary of the Mining Congress.

The reports and the ensuing questions and discussion relative to the work of the committees covered numerous Federal legislative and tax matters. Much interest was shown in the Revenue Bill of 1938, with particular reference to the status of depletion deductions, the undistributed corporate earnings tax, the revaluation of capital stock for capital stock and excess profits tax purposes, and further matters affecting the mining industry. There was discussion of the Guffey Act and the difficulties of the bituminous coal industry in the production and distribution fields.

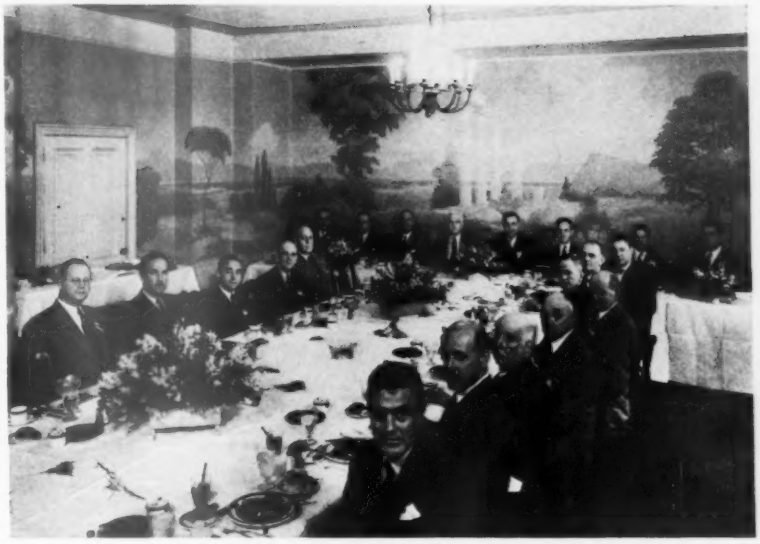
In a discussion led by R. L. Ireland, Jr., operators and manufacturers present joined unanimously in stressing the importance and necessity of holding this Coal Convention and Exposition each year. It was the feeling of all that these annual meetings and equipment displays are of the greatest value in advancing mine operating practices; that those who attend absorb new ideas and enthusiasm, and that improvements in modern mining machinery and methods are stimulated.

A luncheon meeting of the Advisory Council and Board of Governors of the Coal Division of the American Mining Congress was held Wednesday noon, May 4, a full account of which may be found on page 30 of this issue.

ENTERTAINMENT

Worries concerning price structures, competitive fuels, and cost-reducing methods were forgotten each evening from Monday through Thursday, as guests assembled for pleasant hours of relaxation at the Netherland Plaza. The high quality of the entertainment was striking tribute to the splendid work of the entertainment committee, under the direction of Chairman J. K. McCabe, Hercules Powder Company, and Vice Chairman L. F. Crouse, Monroe Coal Mining Company.

Featured during the week were appearances by such outstanding headliners as Jack Dempsey, who refereed the fights on Wednesday night; Lee Sims and Ilomay Bailey, who kept the large banquet crowd spellbound for some 40 minutes with their popular songs, piano improvisations, and delightful personalities; the internationally known Merriel Abbott dancers, a charming and talented group of girls who performed all week; and the Original Old Heidelberg Octet, who presented a fine repertoire of old-time favorites with their inimitable harmony and appealing appearance and personality during all four nights. The octet was also heard informally at the Sunday afternoon cocktail party.



Luncheon meeting of the Board of Directors of the American Mining Congress

Not many will forget the festivities of Jamboree Night, on Monday, with the hundreds of balloons, noise-makers, confetti, and the all around good time. From start to finish, the crowd entered whole-heartedly into the spirit of the evening. R. L. Ireland, Jr., and Mrs. Julian D. Conover led a large group in a grand march to start the ball rolling. From then on there was a steady array of fine talent, with many prize dances and other stunts in which guests participated, including some good old-time group singing, led by C. P. Daniel, Enterprise Wheel and Car Corporation. Demonstrations of the "shag" and "big apple" by a group of trained collegians added tremendously to the gayety, and onlookers got a particular thrill out of watching a number of prominent guests perform in the "big apple" with the Merriel Abbott dancers who very obligingly joined in.

The Pavillon Caprice was transformed into a beautiful Hawaiian scene on Tuesday night, and guests will not soon forget the beauty of the decorations. A floor show, featuring dancing, singing, and tight-rope walking, was well received by the crowd. Festivities on both Monday and Tuesday nights were in the hands of the popular master of ceremonies, Ted Leary.

A double program of entertainment was enjoyed Wednesday evening, with guests assembling first in the Hall of Mirrors to watch four bang-up boxing matches refereed by Jack Dempsey, a whirlwind wrestling bout, and a grand battle royal. In addition, Jack Dempsey was interviewed on the radio by Harry Hartman, sports announcer for Station WCPO, during the fights, at which time appropriate geetings and remarks were added by Secretary Conover and John McCabe, chairman of the Entertainment Committee. The crowd was particularly pleased with Dempsey's fine personality; he made appropriate references to his past experience in coal mining near Logan, W. Va., and called Mr. Gay, of the Gay Coal and Coke Company, his employer while working in the coal fields, into the ring to be introduced to the crowd and the radio audience. Following the fights the crowd adjourned to the Pavillon Caprice, where another fine floor show featuring dancing, songs, a novelty xylophone performer, acrobatics by a headline group, and an interview between Jack Dempsey, Harry Hartman and Mayor James G. Stewart, of Cincinnati.

The annual speechless banquet was held in the Hall of Mirrors at the

Netherland Plaza on Thursday night. Following a delicious dinner, interspersed by spontaneous songs from a number of the tables, Toastmaster Thomas Moses, vice president of the U. S. Steel Corporation of Delaware, first introduced Mayor Stewart, of Cincinnati, who gave a rousing five-minute talk that really brought down the house and started things off with a "bang." Distinguished leaders in the coal industry were then introduced to the gathering by Mr. Moses, following which guests at the tables that had to be cleared away for the floor show stood on the stage and vociferously and enthusiastically joined in singing a lot of old-time favorites. Guest artists during the entertainment that ensued were Lee Sims, sensational popular pianist, and Ilomay Bailey, "Personality Girl of the Air," and so enthusiastically were their numbers received by the guests that they were requested to return six or eight times for encores, to which they responded most generously. The popular program was rounded out by stirring songs from the Old Heidelberg Octet, and with dancing by the popular Merriel Abbott girls. Don Rice, radio's new and widely acclaimed mimic, was at the helm as master of ceremonies, and performed to the great delight of the audience.

MISS RUTH BEST

Miss Ruth Best, of the Ruth Best Entertainment Agency in Cincinnati, organized and supervised the details of the entire entertainment program, and the flawless manner in which it was handled is a real tribute to her ability. She is also very much of a songstress, and contributed a number of solos and joined with the octet in several numbers during the week. Her versatility was further illustrated by the fine manner in which she conducted the floor show on Wednesday as mistress of ceremonies.

The story of the entertainment would be decidedly incomplete without brief mention, at least, of the splendid music furnished by Cliff Burns' Consolideers, who performed for all the floor shows during the entire week and for much of the dancing.

Special Ladies' Entertainment

A growing interest in attending the convention is evidenced by the steady increase in registration of ladies, the number this year rising to 139, an increase of 23 over that of last year.

The special "feminine fun" began on Monday with a "get-together" luncheon at the Restaurant Continentale of the Netherland Plaza, at which about 50 ladies were present. After a delicious luncheon, a visit was made to the famous Taft Museum. Tuesday morning the ladies had the pleasure of watching a fashion show in the Hall of Mirrors, featuring sports wear, afternoon and evening clothes, and climaxed by a bridal procession, with flower girls, bridesmaids, maid of honor, and with Miss Mary Ellen Williams, of Cincinnati, well known to many of the Mining Congress ladies, as bride. Cars were furnished to take everyone to the Fox and Crow, a lovely country inn connected with the Fleischman estate. Mrs. C. L. Harrison was hostess, and in addition she arranged a delightful tour of the Fleischman estate after the luncheon. On Wednesday, Mrs. Conover was hostess to a beautiful bridge luncheon for 75 in the Pavillon Caprice of the Netherland Plaza. The room was most attractively decorated as a garden of flowering shrubs with a lovely fountain in the center. Prizes of Rookwood pottery at each table and fortune tellers provided much entertainment for all. On Thursday numerous sightseeing trips in and near Cincinnati were arranged for those who cared to go, and a considerable number took advantage of this fine opportunity.

THE EXPOSITION

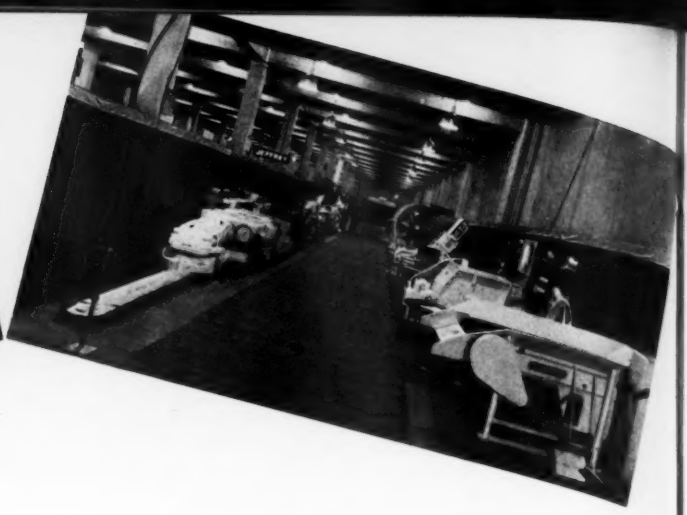
The 1938 Exposition was without question one of the most successful that has ever been held. In the face of adverse business conditions, the manufacturers of mining machinery, equipment, and supplies turned out en masse to present one of the most interesting displays that has ever occupied Music Hall. Although the actual attendance of coal operators was only 6 percent below that of last year, this was more than offset by the interest which they evidenced in the manufacturers' presentations.

Everything essential to modern coal mine operation was included in the many exhibits. With the increasing trend toward modernization and mechanization of mining operations, the interest of coal operators was naturally focused upon the equipment offered by the manufacturers for meeting the many problems thus presented.

Two of the convention sessions were devoted entirely to discussions of conveyor mining and mobile mechanical loaders, emphasizing the pitfalls and difficulties attendant to the adoption of such equipment; and these contributed to the keen desire of operators to study the possibilities of such equipment on the exhibit floors. They found the manufacturers ready to meet their needs with many new developments in cutting and shearing machines, mechanical loaders and all types of conveyor units. Haul-

Above: "Get-together" luncheon for the ladies. Right: Bridge luncheon in the Pavillion Caprice.

Westinghouse
TIMKEN BEARINGS
CARDOX
PREFORMED
Pressure LUBRICATION
SPECIAL FITTINGS
ENTERPRISE
SOLD
AMERICAN
OHIO
EDISON STEEL STORAGE BATTERIES



age demands were answered by offerings of mobile conveyors, trailer haulage units and extremely large capacity mine cars.

Surface preparation came in for its share of attention through the many new types of screening and cleaning equipment shown. A great number of full-sized units were displayed to show the mine owner the many facilities that are available to enable him to meet the rigid market requirements of the present day. Every step in surface preparation was covered up to, and including, dustless treatment and trade-marking of the finished product.

Safety equipment manufacturers supplemented the convention session, devoted to safety, with a display of every known type of device and equipment designed to insure the protection of mine workers and the safe operation of mining plants. These included everything from safety clothing and personal protective equipment to the latest developments in blasting accessories, rock-dusting machines, ventilating fans, and the many new safety features of all types of mining machinery.

ROY L. COX

Vice president in charge of mining sales, The Jeffrey Manufacturing Co., is the new chairman of the Board of Governors of the Manufacturers Division, American Mining Congress

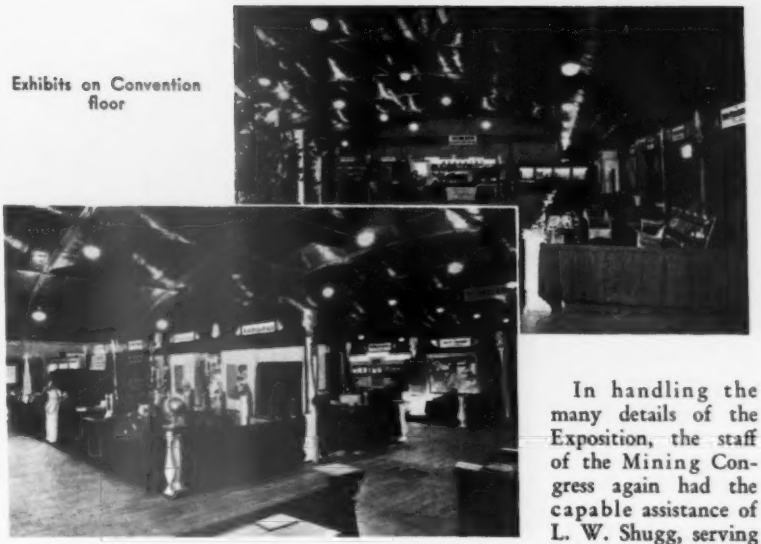
There was not a single phase of coal mining that was not represented in some one of the many exhibits. From the smallest of hand tools used by the mine workers themselves, through a diversified line of maintenance and repair equipment and supplies, to the many complete units of equipment used in our mines today, the exposition had complete coverage, and the coal operators left Cincinnati knowing that the manufacturers were thoroughly prepared to meet their every need.

The interest of the visiting coal men was not merely cursory, as was evidenced from the number of "sold" signs throughout the halls at the end of the week. This was proof that the efforts of the manufacturing companies in developing equipment suited to the needs of the operators had not been in vain.

One of the features of the Exposition this year that proved very popular with exhibitors was a daily radio broadcast sent out by short wave to international points and rebroadcast by Stations WSAI and WLW. With a portable transmitter carried on his back, the announcer strolled through different parts of the Exposition for 15 minutes each day and described the new machinery and supplies to the unseen radio audience. Representatives of the exhibitors were also asked to say a few words about the important uses to which their new equipment could be put. This is only one illustration of the splendid publicity given the event this year which was received most enthusiastically both by exhibitors and by operators.

Another popular feature of the Exposition was the Operators' Sweepstakes, a prize contest conducted to induce a maximum circulation of visiting coal operators throughout the various exhibit halls. The contestants were required to have contest booklets stamped at a number of exhibits in each section of the exposition halls, and a prize drawing was conducted among those who competed. Winners of the prizes were as follows: (1) Charles A. Davis, Hanna Coal Co., of Ohio ($100 cash); (2) A. D. Sweeker, Hanna Coal Co. ($50 cash); (3) Alex Fleming, Rex Coal Co. (table-model radio); (4) George Guiney, Princeton Mining Co. (table-model radio); (5) H. A. Maconaghie, Consolidated Coal Co. (leather golf bag); (6) H. Ferris Burtch, Hatfield Campbell Creek Coal Co. (brown walrus traveling bag); and (7) Mrs. G. G. Crawford, Valier Coal Co. (one leather carryall bag).

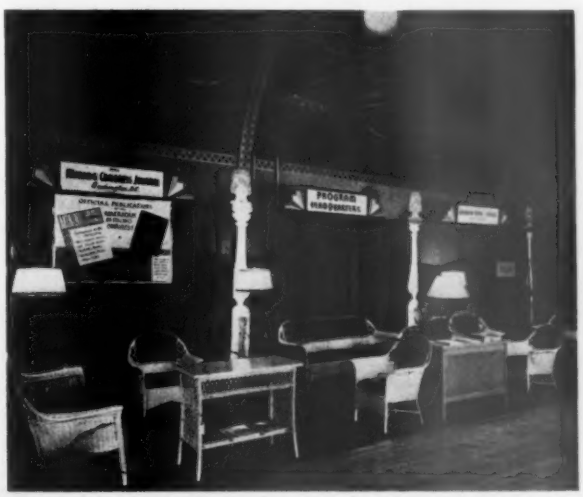
Exhibits on Convention floor



In handling the many details of the Exposition, the staff of the Mining Congress again had the capable assistance of L. W. Shugg, serving as Director of Exhibits through the courtesy of the General Electric Company.

The annual meeting of the Manufacturers' division of the American Mining Congress was held on May 3. William E. Goodman, Goodman Manufacturing Company, who served during the past year as chairman of the organization which annually sponsors the Exposition, presided at the meeting. R. L. Cox, Jeffrey Manufacturing Company, was elected to serve as chairman of the Board of Governors for the coming year, and the other officers elected were as follows: F. E. Mueller, Roberts & Schaefer Co., first vice chairman; A. S. Knoizen, Joy Manufacturing Co., second vice chairman; and E. J. Burnell, Link-Belt Co., third vice chairman.

E. J. Burnell, Link-Belt Company, was elected to fill a vacancy on the Board of Governors created by the request of Mr. Goodman that he be relieved of his duties on this board during the coming year. Present members of the Board are as follows: E. J. Burnell, Goodman Mfg. Co., E. F. Carley, E. I. du Pont de Nemours & Co., Inc.; R. L. Cox, Jeffrey Manufacturing Co.; P. H. Grunnagle, Westinghouse Electric & Manufacturing Co.; A. S. Knoizen, Joy Manufacturing Co.; H. G. Marsh, Carnegie-Illinois Steel Corp.; F. E. Mueller, Roberts & Schaefer Co.; V. J. Nolan, National Carbon Co.; C. B. Officer, Sullivan Machinery Co.; J. T. Ryan, Mine Safety Appliances Co.; L. W. Shugg, General Electric Co.; G. E. Stringfellow, Edison Storage Battery Co.; C. C. Whaley, Myers-Whaley Co.; and J. C. Wilson, Ohio Brass Co.



Booth of the Mining Congress Journal, and Program Headquarters

WHEELS of Government

• *As Viewed by A. W. Dickinson of the American Mining Congress*

THE defeat of the Government reorganization bill early in April brought a lull in administration and congressional activities. There were some days of reflection on the part of Congressmen and others, and there was talk of a more conciliatory attitude on the part of the administration toward industrial enterprise. The Florida primary elections later in the month, with the success of the administration-sponsored Senator Pepper, eased considerably the shock of the Government reorganization defeat. Congressmen and Senators with their sights trained on the November elections again became administration-conscious, and possibility of reviving the reorganization bill in the present session was discussed. Then on May 18 came the returns from the Pennsylvania primary elections clearly showing not only the defeat of the administration's sponsorship but also the probability of an outstanding Republican victory in the fall elections. This situation should have its effect in curbing further attempts at "reform" legislation in the present session.

Taxation

Senate approval of the Revenue Bill of 1938 on April 9 was followed by two weeks of hard and trying work by the conferees for the Senate and the House. Agreement was reached on April 22, and after more than two weeks of work by the drafting clerks and the Treasury representatives, the report was approved by both Houses and finally sent to the President on May 12. As a result, the Revenue Act of 1938 now carries a tax graduated from 12½ percent to 16 percent on net income of $25,000 and under. On incomes above $25,000 the rates are set at from 16½ percent to 19 percent, with a credit of ¼ of 1 percent from the maximum rate for each 10 percent of earnings distributed to stockholders. This is the last trace of the undistributed corporate earnings tax enacted in 1936, and this present provision expires automatically in two years.

The Senate form prevailed in the capital gains provisions, which will tax gains from assets held for less than 18 months at ordinary income rates. Gains from assets held for more than 18 months but not more than 24 months take a 20 percent rate, and where assets are held for more than two years the rate is fixed at a flat 15 percent.

The Pittman amendment, which would have authorized a biennial revaluation of capital stock for capital stock and excess profits tax purposes, with the first revaluation to be made in 1938, was altered so that while it still permits a 1938 revaluation, the further revaluations are to be made every three years.

The Lonergan-Johnson amendment, known as Senate Amendment No. 10 and providing for the "last-in, first-out" method of computing inventories, was rewritten by the drafting clerks and by representatives of the Treasury Department so that in the final form, as approved by the Senate and House, it does not carry the inclusion of "goods in process" in the non-ferrous smelting and refining industries. However, the record made in the consideration of this amendment is such that in the preparations for the next Revenue Bill (probably December 1938), it is anticipated that a thorough investigation of the subject will result in a constructive and adequate wording of the law.

Wage-Hour

The 38-page Ramspeck Bill, which would have used a "weighted average wage" by industries up to a 40c per hour minimum and would have limited the determination of the work-week between 48 and 40 hours, was voted down in the House Labor Committee, and on April 14 by a vote of 14 to 4 the committee reported a measure which would place a nation-wide floor under wages at 25c per hour and limit the work-week to 44 hours. Wages would be raised 5c per hour per year to an ultimate minimum of 40c per hour, and the work week would be reduced two hours per week per year to an ultimate maximum of 40 hours. Additional hours could be worked above the maximum upon payment of time and one-half for the "over-time" worked. In Section 6 of the bill the Secretary of Labor has wide authority to determine what industries are engaged in interstate commerce and hence would come under provisions of the act. The application of Labor Committee Chairman Mary Norton for a rule under which the bill would be given floor consideration was refused by the Committee on Rules by a vote of 8 to 6, and the procedure of last December was repeated in the campaign to discharge the Committee on Rules by the method of petition. As a result the Committee was discharged by a heavy vote on May 23 and on May 24 the bill was passed by the House with amendments exempting perishable food products and agriculture and was messaged over to the Senate where on May 26 it was sent to conference after an agreement had been arranged with southern Senators to include wage differentials. It is believed in some quarters that, based on the recent decision of the Supreme Court in the Packers and Stockyards case, the present House form is unconstitutional—this for the reason that no provision is made for review of orders on wage and hour standards.

Anti-Trust

Late in April came the long awaited administration message on the subject of anti-trust legislation, monopolies and prices. It had been understood for some months that the entire subject was to be referred to a commission for study. The message called for the authorization by Congress of an investigation of monopolistic practices and violations of the anti-trust laws by the Department of Justice, the Securities and Exchange Commission and the Federal Trade Commission, with recommendations for legislation to be made to the Seventy-sixth Congress. Immediately following came a resolution by Senator O'Mahoney, of Wyoming, appropriating $500,000 for such a study by a National Economic Committee of two Senators, two Representatives, the Department of Justice, the Securities and Echange Commission and Federal Trade Commission. Another recommendation by the President called for an additional $200,000 to enable the anti-trust division of the Department of Justice to pursue a vigorous prosecution of trust law violations.

Stream Pollution

The Vinson Bill (H. R. 2711), which has been in conference since August, 1937, has in recent weeks again been the subject of an attempt by certain municipal, state and wildlife organizations to secure a compromise between House and Senate provisions with a view to enactment. It was suggested that the enforcement provisions of the bill in conference, as contained in Sections 8 and 9, be eliminated. However, such treatment would not have removed from the bill features which would permit arbitrary and hasty action against industrial enterprise, and the House conferees who from the first have stood firmly for the original form of the Vinson Bill as it passed the House in 1937, have thus far made no change in their position.

Strategic Minerals

The problems of the strategic and critical minerals, under national defense and industrial needs, is before the administrative departments of the Congress today as a concomitant of the international situation. Late in April Director John W. Finch, of the U. S. Bureau of Mines, in addressing the convention of the American Zinc Institute at St. Louis, urged the immediate purchase and retention not not only of adequate stock piles of strategic minerals for the national defense, but also an annual appropriation of $500,000 to be used for a comprehensive study of ways and means of adapting our domestic reserves of strategic minerals to form a permanent solution of our deficiency mineral problem. In his address Dr. Finch named aluminum, antimony, chromium, manganese, mica, nickel, mercury, tin and tungsten as minerals which should be stock-piled.

There have been a number of bills before the national Congress since the World War when the need of certain minerals was so keenly felt. In the present session Senator Miller, of Arkansas, has introduced a bill to provide $40,000,000 for the purchase and storage of manganese ore. Recently Senator Thomas, of Utah, as chairman of a Military Affairs Subcommittee, has introduced a bill to provide for the immediate purchase of strategic and critical raw materials and for investigation by the Bureau of Mines and the Geological Survey of occurrence of ores and mineral substances, and of methods for finding and making them available. Representative Scrugham, of Nevada, has also introduced a bill which carries a program for location, development and treatment of strategic minerals by the Bureau of Mines

(*Concluded on page 56*)

—Horydczak

A view of the National Cathedral, from the Bishop's Shadow House

NEWS and VIEWS

MEETING OF AMERICAN ZINC INSTITUTE

- ***Political, economic and technical problems facing the industry aired at 20th annual meeting***

The annual meeting of the American Zinc Institute was held at the Hotel Statler in St. Louis, Mo., on April 25 and 26. A meeting of the Galvanizers Committee of the Institute was held in conjunction with the annual meeting.

Howard I. Young, president of the American Zinc, Lead and Smelting Company, and president of the Institute, presided at the opening session on Monday morning, and first introduced W. L. Hemingway, chairman of the board of the St. Louis Chamber of Commerce, who gave a welcoming address. A response was made by Charles T. Orr, first president of the Institute, who told how the organization got its start 20 years ago. E. V. Gent, secretary of the Institute, reported on the work that had been done in actively opposing any change in the existing tariffs on zinc and zinc products now being considered in connection with pending reciprocal trade agreements with Canada and the United Kingdom. Mr. Gent also urged closer cooperation with sales and promotion departments of steel companies in the campaign for more widespread use of galvanized sheets bearing the "Seal of Quality" symbol.

Political Developments Outlined

Developments of political and economic nature in Washington that have had a pronounced effect on the situation in zinc were outlined in detail by Julian D. Conover, secretary of the American Mining Congress, who, after commenting briefly on the business cycles since 1890, stated that "from every standpoint the present depression is a phenomenon of major proportions; a tremendous, devastating force in our economic picture. Eminent opinion, however, holds that we have already traversed the ground that should be necessary to eliminate ordinary economic maladjustments, and to start things upward once more. The general level of prices is not regarded as a deterrent to recovery, and any needed processes of liquidation have run their course. Why, then, do we continue in the depths of this depression and what were the causes which plunged us into a nosedive? Opinion from sound, hard-headed business men and economists whose views command respect, relates our present troubles directly to those actions and policies of our national government which are frightening or stifling ordinary business initiative, and holding back the natural forces of recovery." Major causes for the present depression were then summed as including: (1) Taxation both as to its form and its magnitude; (2) government attitude toward labor and toward employer; (3) government competition, both actual and threatened; (4) the railroad problem; and (5) the utility problem.

After outlining each one of these factors in considerable detail, Mr. Conover stated, "For a real answer to the present critical problems of our country we need a definite change in present policies of government on taxation, on labor, on bureaucratic regulation of industry, and on government competition with private enterprise. We need to remove the devastating effect of such policies, and in the words of Secretary Morgenthau last November, 'to foster the full application of the driving force of private capital'; we need to remember that 'upon the unimpaired credit of the United States Government rests the safety of deposits, the security of insurance policies, the activity of industrial enterprise, the value of our agricultural products, and the availability of employment—national recovery depends upon it.' And when these things are done there would appear to be no reason why we cannot again go forward, why the trend in America towards a rising national wealth, a rising national income, and a rising standard of living, which has obtained in every previous decade of our history, may not be resumed."

Ingalls Briefs Zinc Situation

With John A. Robinson, vice president and general manager, Commerce Mining and Royalty Company, presiding, the Monday afternoon session was devoted largely to analyses of the zinc mining and smelting market. A report of the Traffic Committee was presented by W. A. Moore, chairman, following which a paper by W. R. Ingalls, director, American Bureau of Metal Statistics, on "Outlook for Zinc Mining and Smelting," was read by R. B. Caples, assistant general superintendent of the Anaconda Copper Mining Company's Reduction Department.

After outlining some of the features of statistical technique, Mr. Ingalls proceeded to review briefly the situation of zinc in 1937 and presented 10 important factors to consider in diagnosing and forecasting the position of zinc. Summing up the situation, he said, "The domestic outlook for zinc in 1938 is closely interwoven with our broad economic prospects, including the building of houses and other edifices, the manufacture of automobiles, the fencing by farmers, etc. At the present time all of those channels of consumption are running pretty dry. I wish I knew when the flow through them is going to swell. I can say no more than that I see no conditions obstructing zinc consumption in any channel, meaning that in automobiles, houses, etc., we shall continue to use about the same proportion of zinc per unit as heretofore, and in some minor channels the

chances are that we may use more.

We have experienced, however, a serious dislocation in affairs, from which readjustment will require patience, even after we are convinced that the tide of our present recession has turned. . . . I think that our future is going to be determined by more important things. In America, with a plethora of natural resources, with only a few deficiencies requiring importation, for which we are amply able to pay, we have been misguided into a philosophy of scarcity in the hope of creating high prices for houses, agricultural products, labor, and everything else. In Europe, where there is no country that is self-sufficient in natural resources, except that the British Empire has a great deal and also an ability to pay, there is a philosophy of increasing production and curtailing consumption, and avoiding waste. In these great economic struggles, zinc is a very minor factor, but nevertheless it is in the maelstrom."

Plea for Study of Strategic Minerals

The morning and afternoon sessions on Tuesday were held jointly with the Galvanizers Committee, and covered a variety of subjects, including an address on "Strategic Minerals in the United States" by Dr. John W. Finch, director, U. S. Bureau of Mines. He advocated the immediate purchase by the Federal Government of adequate stockpiles of strategic minerals as one of the most effective means of meeting present problems of national defense. Nine minerals are classified as strategic by the War Department, including aluminum, antimony, chromium, manganese, mica, nickel, mercury, tin, and tungsten. A second list, classified as "critical materials," contains 25 minerals and includes such abundantly produced commodities as iron and steel, copper, lead, zinc, and petroleum. Dr. Finch recommended the annual appropriation by the government of $500,000 to be used by the Bureau of Mines and the Geological Survey for a comprehensive study of ways and means of adapting domestic reserves of strategic minerals to a permanent solution of the deficient mineral problem. A reduction in the present tariff on lead and zinc can hardly be considered in the public interest if viewed from the standpoint of national defense, he stated. "The whole situation should be studied exhaustively by appropriate government agencies with public funds adequate to support the comprehensive program of exploration, research, and development," he said. "The experience of the past 20 years clearly indicates the necessity of supplementing the activities of private enterprise by some government action. It is not contemplated that government shall engage in the production of minerals in competition with private business, and the present activities of domestic producers need not be disturbed in any way. To the contrary, such a program would inevitably result in great benefit to the mining industry by supplying reliable information as to reserves of different grades of ore, degrees of self-sufficiency obtainable with the various minerals, and the probable cost of production. These data would provide a sound basis on which industry could appeal to Congress for such tariff protection as is needed to guarantee successful development of domestic resources."

Officers reelected were as follows: Howard I. Young, president; C. Merrill Chapin, Jr., John A. Robinson, and James O. Elton, vice presidents; James A. Caselton, treasurer; and Ernest V. Gent, secretary.

April flood in Wallace, Idaho

Left: Scene at Second and Cypress Streets—Placer Creek in full flood

Right: Flooded Placer Creek (center) at junction with South Fork of Coeur d'Alene River (foreground)

Coeur d'Alene Flood Damage

Floods from rain and fast-melting snow swept through the Coeur d'Alene mining region in the third week of April and caused damage estimated at $350,000, chiefly to business and residential property in Wallace, Idaho, the business center of the district. It was the worst natural-cause disaster in that region since 1910, when forest fires reached into the town. Much of the disaster in Wallace was caused by a torrent which swept down Placer Creek from the south. Railroad tracks were torn up and there was no travel into the district by train, bus or automobile for three or four days. The Hecla mine closed down for a few days because it was unable to ship its concentrates to the Bunker Hill smelter, and the Morning and Page mines shut down because they could not ship their concentrates to the East Helena smelter. Idaho Mother Lode Mines Company was forced to cease operations in both mine and mill at its property near Murray, Idaho. Water stood 3 ft. in its mill, and the entire tail race and part of the 6-in. steel air line went out.

First Shipment from Howe Sound

Howe Sound Mining Company made its first shipment of 200 tons of copper concentrates April 11 from its newly acquired property at Holden, Wash., in the Cascades. Its mill has a capacity of 1,000 tons a day and is the largest plant for treating metalliferous ores ever built in that state.

The Chilhowee coal mines, a half mile west of Chilowee, Mo., are being reopened after a shutdown period of 30 years.

Tetlow Named Chairman of Coal Commission

• *Discount and Allowance Hearings Recessed*

Activities of the National Bituminous Coal Commission during the past month primarily centered about the accumulation of evidence which will enable the Commission to prescribe maximum discounts and price allowances which can be made by code members to distributors, and to establish rules and regulations governing such distributors. A parade of witnesses appeared before the Commission submitting suggestions as to who might be registered as distributors of bituminous coal and rules to cover their activities. Representatives of farmers' cooperative organizations appeared before the Commission and asked that they be allowed to retain their present discount on bituminous coal.

Charles O'Neill, spokesman for producers in the Appalachian coal region, told the Commission that producers want maximum discounts to distributors and farmers' cooperatives computed on a flat cents per ton basis. He suggested that they range from 10 to 50 cents per ton depending upon various marketing factors. In a supplementary proposal involving only Pennsylvania, he suggested that discounts be extended to include railroad locomotive fuel.

Coal wholesalers, through W. W. Bayfield, executive secretary, American Wholesale Coal Association, suggested that the Commission authorize computation of discounts on a percentage basis.

Appearing for producers in Washington, Oregon and Alaska, T. M. Leeder and James S. Ramage, Seattle, Wash., described conditions in the far West and asked for discounts larger than common in the East. Floyd R. Pool, Vice President of the McNeil Coal Corporation, Denver, Colo., urged the Commission to authorize discounts to distributors only on carloads of coal moving by rail. He represented producers in northeastern Colorado, and suggested that no discounts be established on quantities of coal equivalent to carloads but which are hauled in trucks. Charles W. Shinnamon, executive secretary, Producers' Board No. 3, Fairmont, W. Va., representing northern West Virginia producers, suggested that computation of discounts and allowances be made to distributors and

PERCY TETLOW

farmers' cooperatives on a cents per ton basis dependent upon the types of coal and marketing areas. Representatives of the western Kentucky district favored a flat percentage discount to all distributors marketing coals in 14 states in the middle and northwestern sections. Producers from West Virginia Panhandle district proposed discounts ranging from 10 to 35 cents per ton depending upon types of coal and market areas into which shipped. This included 10 cents per ton on railroad locomotive fuel. Members of the district Producer's Board of District 15 (Missouri, Kansas, Texas, and Oklahoma) urged that discounts be allowed not to exceed 8 percent per ton F. O. B. mine on prepared sizes and discounts of 10 to 75 cents per ton on all other coals depending upon the types and marketing areas into which shipped. Discounts of from 10 to 50 cents a ton depending upon the types and sizes of coal and the marketing areas were suggested by the Producers' Board representing southeastern West Virginia and northwestern Virginia coal producers. Representatives of District Board No. 10 urged discounts ranging from 10 to 20 cents a ton.

The discount hearings were recessed on May 5 until June 27.

Tetlow Named Chairman

Impetus was added to the setting of new prices when Percy Tetlow of Ohio was elected permanent Chairman of the Commission on May 11. He succeeds Charles F. Hosford, Jr., of Pennsylvania, and his term will expire in December 1938. The successor to Hosford as a member of the Commission has not yet been named. Usually reliable sources have indicated that the new member will be selected from Pennsylvania.

Mr. Tetlow was appointed a member of the National Bituminous Coal Commission in September 1935, and was reappointed in May 1937. He is a representative of the miners. His election as Chairman of the Commission was unanimous and followed a motion which cited the progress made under his leadership toward the re-establishment of minimum prices.

When Mr. Tetlow was acting Chairman of the Commission, he notified representatives of the industry that there would be no delay in the enforcement of minimum prices when they are established. He is on record as stating that the establishment of new prices will be based firmly on facts, so that there can be no question as to their validity. Mr. Tetlow has announced that during the interim in price erection, the Commission is working out with the Internal Revenue Bureau a plan for collecting all delinquent taxes which should be paid under the Bituminous Coal Act of 1937. The enforcement of minimum prices when they are established calls for the setting up in Washington of a Compliance and Enforcement Division which will be coordinated with the District Statistical Bureaus and the Producers' Boards. In a recent address before a conference in which representatives of the industry and the Consumers' Counsel met with the Commission to discuss the procedure for setting new prices, he said: "This law will be sustained if we now proceed to work out its requirements and we propose to do that now, and just as quickly as we can. When we arrive at the point where minimum prices can be determined, then the procedure and the prices established will be respected and will be sustained in any court in the land. That is what we propose to do. It may appear to us a long road, but the purpose for which it is enacted will finally win approval in this country, I am quite sure."

The Commission has directed all producers of the country to furnish it with complete data concerning the distribution of coal during 1937. These data must be in the hands of the Commission by June 1. The weighted averages of the total cost of

ascertainable tonnages produced in each district in 1936, adjusted to reflect changes in wage rates, hours of employment, or other facts since January 1, 1936, have been submitted to the Commission by the District Producers' Boards.

Act's Validity Being Challenged

The validity of the Bituminous Coal Act of 1937 is being challenged in the Federal Courts. The Sunshine Anthracite Coal Company, operating mines in Johnson County, Ark., filed suit with the Federal Court at Little Rock, Ark., on May 9 challenging the validity of certain provisions in the Coal Act. The company is contending that its product is not bituminous and therefore is not subject to the provisions of the Act. It specifically asks that an injuction be issued preventing the Collector of Internal Revenue from attempting to collect the 19½ percent tax levied on the production and sale of bituminous coal by non-code members. It is reported that the constitutionality of the Act has also been challenged by the company on the ground that it invades state rights, and that it deprives the company of property without due process of law.

Sunshine Reelects Officers

Sunshine Mining Company has reelected its directors and officers, including R. M. Hardy, Yakima, Wash., president; C. M. Hull, Yakima, secretary; and R. D. Leisk, general manager. The property is in the silver belt of the Coeur d'Alenes. The annual meeting was held at Yakima, April 12. Stockholders received a report from the company stating that its net income in 1937 totaled $5,401,457. In the year dividends were paid to the amount of $4,466,460.

"Steel—Man's Servant"

The above is the title of the first industrial talking motion picture in technicolor ever filmed, which has been created for the United States Steel Corporation subsidiaries. This film, which requires about 40 minutes to show, was recently presented in Washington and has also been shown during the past month in many other points throughout the country.

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Attention—Metal Mine Operators!

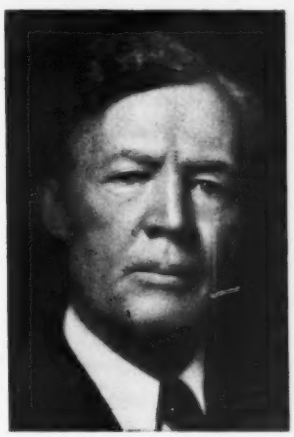
Plans for the 5th Annual Metal Mining Convention and Exposition of the American Mining Congress to be held at the Ambassador Hotel, Los Angeles, Calif., October 24 to 27, are rapidly taking tangible form.

STANLY A. EASTON

Stanly A. Easton, President of the Bunker Hill and Sullivan Mining and Concentrating Company, Kellogg, Idaho, was recently unanimously elected Chairman of the Board of Governors of the Western Division of the American Mining Congress, and in this capacity he will take an active part in shaping plans for this memorable event. He succeeds Oscar N. Friendly, Vice President and General Manager, Park Utah Consolidated Mines Company, Salt Lake City, Utah.

T. H. O'Brien, Vice President and General Manager, Inspiration Consolidated Copper Company, Inspiration, Ariz., is National Chairman of the Program Committee for the meeting; and Robert Linton, of Los Angeles, has accepted the Chairmanship of the General Committee on Arrangements. Mr. Linton is Chairman of the Mining Committee of the Los Angeles Chamber of Commerce, and was active in bringing the Convention to the California city.

A nation-wide Program Committee is now being selected, and more than



T. H. O'BRIEN

ROBERT LINTON

8,000 questionnaires have been sent to mining men calling for suggestions of topics to be presented at the Convention. A meeting of the Committee will be held in Los Angeles June 21.

In conjunction with the Convention sessions, there will be held an Exposition of metal mining machinery, equipment and supplies, in which a large number of nationally known manufacturers will participate. Displays of equipment will include everything needed for modern metal mine and mill operation. Almost half of the available space has already been taken at this early date, thus assuring a fine representation.

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Silver King Shuts Down

Operations of the Silver King Coalition Mines Company at Park City, Utah, were closed down for an indefinite period effective April 30, because of metal prices, economic and other prevailing conditions.

Utah Chapter of American Mining Congress Elects Officers

At the annual meeting of the Utah Chapter, American Mining Congress, held April 2, officers were elected as follows: Governor, E. A. Hamilton, general manager of mines, Western Division, U. S. Smelting, Refining and Mining Company; first vice governor, James Ivers, vice president and general manager, Silver King Coalition Mines Company; second vice governor, W. J. O'Connor, manager, American Smelting and Refining Company; third vice governor, F. S. Mulock, vice president and general manager of western operations, U. S. Smelting, Refining and Mining Company; and secretary, A. G. Mackenzie.

M. G. Heitzman, manager of operations, Silver King Coalition Mines Company, was elected director of the chapter to succeed the late W. Mont Ferry, former vice president and managing director of that company.

Rocky Mountain Coal Mining Institute

The thirty-sixth regular meeting of the Rocky Mountain Coal Mining Institute will be held in Denver, June 23, 24, and 25, at the Shirley-Savoy Hotel.

Mr. A. F. Krippner is general chairman in charge of the meeting. Committeemen working with him include: Program, E. H. Denny (chairman), Benedict Shubart, Fred Whiteside, J. R. Lawson, E. C. Horne; dance and entertainment, J. S. Veatch (chairman), Walter Tripp, G. M. Schloss, Monroe Hornsby, J. B. Howe, and M. B. Urquhart; banquet, John H. Emrick (chairman), C. E. Pester, C. E. McWhorter, W. J. Morris, and Paul D. Steele; exhibits, B. A. Franklin (chairman), A. G. Brown, Walter Bachman, John McG. King, and James Dalrymple; and favors for ladies, G. N. Robinson (chairman), J. E. Mason, and Rudolph Fox.

H. C. Marchant is secretary of the Institute.

Mountain City

(*Continued from page 15*)

of Nevada and the United States come in for a handsome amount in taxes from an area previously a liability, not an asset. Truckers earn a good livelihood hauling the ore; and farmers, supply-houses, railroads, merchants and manufacturers all possess a new source of income which they did not have before.

Right to the end of the story, too, continues the parallel between Frank Hunt and Aladdin. Like the possessor of the magical lamp, the old prospector has been a generous benefactor to humanity. The farmer, with whom he boarded near Mountain City in the days of adversity, received a block of stock. So did relatives, old cronies and acquaintances. To the man who grub-staked him for ten years and then showed him the door, he donated 100,000 shares for "good-will." For himself and several of his relatives he has purchased annuities that assure generous incomes during their remaining years.

And unlike many another millionaire, he has not forgotten the State where he made his wealth. Believing that the commonwealth which so bountifully rewarded his zeal should share in his good fortune, he created the S. Frank Hunt Foundation at the University of Nevada, Reno, endowing it with 10,000 shares of stock.

The amount from this and other cash gifts, estimated to total $200,000, is to be used to finance study in the field of geology, mineralogy and mining. Through the largess of this fund, promising students, whose development might be otherwise hampered, are given a chance to go out into the field and come in contact with the conditions governing the discovery and making of mines.

This is S. Frank Hunt's hobby—to make more good prospectors so that other mines like Mountain City Copper may be discovered, and humanity enriched and benefited by the development of clean, new wealth.

Wheels of Government

(*Continued from page 51*)

and Geological Survey, with an annual appropriation of $500,000 for each of the fiscal years 1939, 1940, 1941 and 1942.

Representative Scrugham has also secured in the Naval Appropriations Bills for fiscal 1937 and 1938 the appropriation of $3,000,000 in each year and for 1939 an appropriation of $500,000 for the purchase and storage of strategic minerals. In the past year the Navy Department has consumed the major amount of the $6,000,000 in the purchase of ferro-manganese and chrome ore from domestic sources, and it is understood that purchases of tungsten concentrates or ferro-tungsten are under consideration.

Foreign Trade Agreements

While the United Kingdom and Canadian Foreign Trade Agreements are understood to be under negotiation, there are no definite assurances as to the date when these treaties will be officially promulgated. Two months ago it was unofficially estimated that the United Kingdom treaty would be made public about the first of June and the Canadian agreement soon thereafter. The situation of mineral producers, particularly of lead, zinc, tungsten, feldspar and fluorspar, who have presented their briefs and oral statements to the Committee for Reciprocity Information, is extremely difficult. Ever since the close of the oral presentations prices, market conditions and unsold stocks of concentrates and metal has presented an increasingly serious situation. Many mines are closed down and miners are idle. Whole communities are concerned, and their purchasing of consumer's goods and capital items has been greatly curtailed. Mining enterprises are at a loss as to how to proceed either with further development or with partial or complete shut-down. Nothing can be known until the treaties are announced, and there is at present no definite information as to the date of announcement.

One encouraging light in this rather dark picture of the Foreign Trade Agreement situation is the expression of Dr. Finch, of the Bureau of Mines, in his recent St. Louis address that "a reduction in the present tariff on lead and zinc can hardly be considered in the public interest if viewed from the standpoint of national defense." While lead and zinc are not listed as strategic or deficiency metals they are classified by the War and Navy Departments as "critical materials," and the abandonment of ore bodies now producing or capable of immediate production would certainly at this time be looked upon with concern.

PERSONALS

C. H. MEAD, for 25 years a coal operator in Raleigh, Wyoming, and Fayette Counties, W. Va., has ceased operating coal mines to establish a coal brokerage business. He will engage in the sale, purchase, and leasing of coal properties.

GEORGE A. EASLEY, mining engineer of New York City, gave the principal address May 24 at the commencement exercises of the School of Mines and Metallurgy, University of Missouri.

C. F. KELLEY, president of Anaconda Copper Mining Company, and CARL T. ULRICH, vice president of sales of Kennecott Copper Corporation, sailed late in April for Europe.

D. L. McELROY

D. L. MCELROY has submitted his resignation as assistant director of the Mining and Industrial Extension Department, West Virginia University, effective July 31, to become head of the Mining Engineering Department of Virginia Polytechnic Institute at Blacksburg, Va. Mr. McElroy has served in his present position for the past 10 years. He is also the author of a bulletin on "Coal Mine Haulage in West Virginia," which was published by the University in July, 1934.

JOHN T. SYDNOR was recently appointed manager of mines of the operations of the West Virginia Coal and Coke Corporation in the Logan Field, and has established his home at Omar, W. Va., general offices of the company.

Mr. Sydnor held the position of general superintendent of the Mallory Coal Company, an affiliate of the Island Creek Coal Company, until eight years ago, when he resigned to become general superintendent of the Red Parrot Coal Company at Prenter, Boone County. He was general superintendent at Mallory for 10 years.

R. L. IRELAND, JR., president, Hanna Coal Co. of Ohio, was elected president of the Ohio Coal Control Association at the annual meeting of this organization held April 18 at Cleveland. Other officers named were: vice president, Wm. Emery, Jr., president, Cambridge Collieries Co.; executive vice president, Ezra Van Horn; secretary-treasurer, D. F. Hurd; assistant secretary-treasurer, E. H. Miller. The organization changed its name to the Ohio Coal Association.

BJORGE ROSING has been appointed general sales manager of the West Virginia Rail Company, Huntington, W. Va. For the past three years Mr. Rosing has been connected with the International Derrick and Equipment Company, Columbus, Ohio, as division sales manager; and prior to this he was associated with the Mt. Vernon Bridge Company, Mt. Vernon, Ohio; the American Bridge Company; and the Canadian Bridge Company, in various engineering capacities.

E. G. GNAEDINGER, consulting engineer of Wallace, Idaho, will direct the new deep development just authorized at the Silver Dollar Mine in the silver belt of the Coeur d'Alene district.

ALEX ROSSER, veteran electric construction foreman of the Glen Alden Coal Company, was given a testimonial dinner in Wilkes-Barre, Pa., on April 23 by friends and former associates. Mr. Rosser retired April 1 after rounding out over 40 years of service with the D., L. and W. Coal Company and its successor, the Glen Alden Company.

J. T. LUSIGNAN, JR., has been appointed executive engineer of the Ohio Brass Company, Mansfield, Ohio. Formerly engineering assistant to the vice president, Mr. Lusignan will now supervise all engineering activities of

J. T. LUSIGNAN, JR.

the O-B organization. He was instrumental in the design of the present high-voltage test and research laboratory at the Barberton plant of the Ohio Brass Company, and was also responsible for the development of a new impulse generator.

E. T. STANNARD, president, Kennecott Copper Corporation, was recently elected to the Board of Directors of the Johns-Manville Corporation, replacing ALFRED T. SLOANE, JR., who resigned owing to pressure of other duties.

CARL H. COLE, well-known Arizona mining man, has been appointed superintendent of the Smelter Division, Copper Queen Branch, Phelps Dodge Corporation, according to an announcement by H. M. Lavender, general manager of the company. He

succeeds the late HARRY A. CLARKE in this position. Mr. Cole joined the staff of the Calumet and Arizona Mining Company in 1913, and has held the position of metallurgist at the Douglas plant since 1916, retaining his post when the two companies were merged in 1931.

H. FOSTER BAIN, of Wright, Dolbear and Company, New York City, and special adviser to the Philippine Bureau of Mines, has been back in the United States for a short visit, but will soon return to the Philippines. His address there will be care of Philippine Bureau of Mines, Manila, P. I.

DONALD A. CALLAHAN, vice president of the American Mining Congress, recently returned to his home in Wallace, Idaho, with Mrs. Callahan and their daughter, following a stay of about six months in Washington, D. C., on business.

W. D. HASELTON, of Pickands Mather and Company, Duluth, Minn., has returned with Mrs. Haselton from a European trip which included visits to England, Germany, Sweden, and France.

DR. C. G. POTTER, of Fairmont, W. Va., has been appointed assistant to NEWELL ROBERTS, as head of the National Bituminous Coal Commission Division of Markets. Dr. Potter will also act as price examiner, specializing in industry matters for Districts 1, 2, and 3. He has a long and interesting record as chemical engineer, technologist, coal executive, and research authority. He was formerly connected with the NRA Bituminous Coal Code authority and with the American Mining Congress.

PAUL W. PERKINS, of Chicago, has been appointed price examiner of the National Bituminous Coal Commission for Illinois and Indiana.

E. W. THORNLEY, vice president of the American Smelting and Refining Company, has been elected a director of Revere Copper and Brass Company, Inc., New York City.

A. G. MACKENZIE, secretary of the Utah Chapter, American Mining Congress, has returned to his home in Salt Lake City, Utah, after spending the winter and spring in Washington, D. C., accompanied by Mrs. MacKenzie.

—*Obituaries*—

HUNTINGTOM ADAMS, mining engineer, died in New York on May 17, after a protracted illness. Mr. Adams, who was 58 years old, had been active in mining operations in Mexico and South America, and later as a consultant in New York City.

HAROLD N. LAWRIE, geologist and economist, died May 19 in Johns Hopkins Hospital, Baltimore, after a long illness. Mr. Lawrie was an authority on gold and silver and their relation and importance in world economy.

After service as consulting geologist and chemist in western states and British Columbia between 1905 and 1917, he was economist for the American Mining Congress in Washington, D. C., 1919 to 1921. Subsequently he was managing director of the American Gold and Silver Institute, with headquarters in Washington, during 1921 and 1922. Mr. Lawrie had appeared many times before congressional committees, and in 1923

HAROLD N. LAWRIE

was retained as economist to the Senate Commission which conducted an inquiry into gold and silver. He also served for some time as secretary to former Senator Tasker L. Oddie, of Nevada. Mr. Lawrie was author of many articles pertaining to gold and silver in the technical press.

THOMAS H. WICKHAM, widely-known coal man of southern West Virginia, died early in May of a heart attack at his home in Beckley, W. Va., at the age of 85.

At the time of his death, Mr. Wickham was president of the Lillybrook Coal Company, treasurer of the Raleigh Smokeless Fuel Company, and also a stockholder in the Pemberton Coal and Coke Company. With Fred E. Lilly, he opened the Princewick Mine, which was later sold to the Koppers Coal Company, and he was also a part owner of the E. E. White Coal Company, also sold to Koppers.

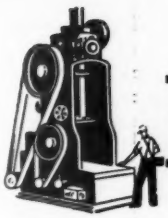
RONE B. TEMPEST, general manager of the Chino Mines of the Nevada Consolidated Copper Corporation, died in Silver City, N. Mex., on May 7, at the age of 55, from a self-inflicted bullet wound. Worries over labor troubles at his mine apparently had been troubling him for some time, and

RONE B. TEMPEST

he was particularly upset by the National Labor Board's hearing on charges of unfair labor practices.

EDWARD J. CORNISH, chairman of the board of the National Lead Company, died of a heart attack in his New York office on May 4, at the age of 76.

Mr. Cornish had been chairman of National Lead Company since 1933, prior to which he had been president. In addition to his position with the National Lead, Mr. Cornish was at the time of his death a director of the Chase National Bank, a director and chairman of the board of the Patino Mines and Enterprises Consolidated, Inc., a director of the Baker Castor Oil Company, and a director of the National Industrial Conference Board.



MANUFACTURERS' Forum

Westinghouse Executives Assigned New Duties

Three vice presidents and two division managers of the Westinghouse Electric and Manufacturing Company have been assigned new duties in a revised schedule of responsibilities announced by President George H. Bucher.

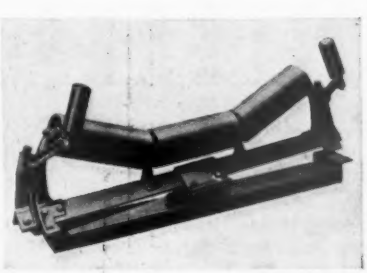
Vice President Ralph Kelly is placed in charge of sales of the company, with headquarters in the Pittsburgh executive offices. Formerly he was in charge of Pittsburgh district works, including the headquarters plant at East Pittsburgh.

Vice President R. B. Mildon assumes management of the East Pittsburgh division, coming here from Philadelphia, where he had charge of the steam and stoker departments,

Vice President N. G. Symonds, long associated with sales operations, will devote his time in the sales department to specific customer activities, association work, and special duties as assigned.

Self-Aligning Belt Idler

A new self-aligning idler for automatically training conveyor belts without damaging the belt is announced by the Jeffrey Manufacturing Company, Columbus, Ohio. It consists of a standard anti-friction idler pivotally mounted on a supporting cross member, with guide rolls at each end. These guide rolls are mounted on pivoted arms that extend at right angles to the idler in the direction from which the belt approaches.



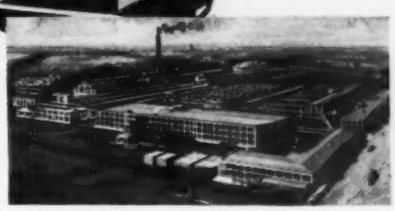
Exide Observes Golden Anniversary

The Electric Storage Battery Company, manufacturer of Exide batteries, began this month to observe its golden anniversary year.

The company, which enjoys the distinction of being the largest manufacturer of storage batteries in the world for every purpose, was founded in June, 1888, in a small, one-story brick structure near Gloucester, N. J. At that time the storage battery existed mainly in laboratory theory. Commercial development had not been started on any substantial scale in this country. It is conceded that the history of this company is in reality the history, to a great extent, of the industry itself.

Top: Philadelphia office and plant

Right: Original building in Gloucester, N. J., where the Electric Storage Battery Co. started in 1888



Lower right: Crescentville plant on outskirts of Philadelphia

Engineers and business men in those early days of the company were frankly skeptical of the storage battery and progress was slow. But as the company demonstrated the value of its product, its business grew along with the electrical industry, which had just entered the period of expansion.

The original small building was soon to become too small, and additional space was found necessary in a near-by factory building. In 1894, however, the "works" was moved to the first floor and basement of its present building, at Nineteenth Street and Allegheny Avenue, in Philadelphia. Additional floors were added until in 1904 the entire group of buildings were acquired. In 1911 another building was added to the group to be followed by another in 1917. Two years later, a 40-acre tract of land was purchased at Crescentville, on the northeastern edge of Philadelphia, and what is now the most modern battery building plant in the world was erected. At this plant raw material enters one end and passes out the other in the form of Exide batteries.

With the addition of the Crescentville plant, floor space in excess of 30 acres is now devoted to the manufacture of Exide, Exide-Chloride, and Exide-Ironclad batteries in many sizes, types, and capacities. Adjoining the Crescentville plant and surrounded by a baseball field, tennis courts, and a picturesque grove is located the employes' clubhouse.

In order that users of Exide batteries of industrial and commercial types may secure prompt and efficient service, there are company branches, depots, and operating departments with engineering field service in 19 cities strategically located throughout the country.

Although the manufacture of Exide batteries for automobiles is one of the company's major activities, it is not the only one. The variety of uses to which Exides are put is as wide as industry, science, and commerce.

Safety Block Signal System

The Mosebach Electric & Supply Company, 1103 Arlington Avenue, Pittsburgh, Pa., has just introduced a

new electric safety block signal system for efficient mine haulage. It is a one-way traffic system, manually controlled at any point, for the movement of trips for either direction.

In such an installation, stop and go signals, conveniently placed in accordance with the needs of the particular haulage problem, can be operated by the snapper or motorman at any point within the section. The lights are hooked up in series and are controlled by Gill manually operated electric signal switches. When the switch is thrown, all lights change in the hook-up. It is claimed that the new system will speed up production and cut down haulage accidents. The manufacturer will be glad to forward descriptive literature and quote prices upon request.

PETER F. LOFTUS

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Sullivan Staff Changes

The Sullivan Machinery Company announces a change in the personnel of its Coal Mining Machinery Division. Mr. J. F. Joy, who has been general manager of this division of the Sullivan Company, now becomes special consulting engineer on all problems relating to coal mining and the development of machinery used in the mining of coal. Mr. Charles H. Tipping, previously district manager in the St. Louis office, becomes general manager of the Coal Mining Machinery Division. Mr. William R. Jarvis is sales manager of this division; Mr. R. A. Lehner, chief engineer.

J. F. JOY

The Sullivan Machinery Company feels most happy to be able to retain the services of Mr. Joy, because of their belief that in so doing they can continuously increase their value to the coal mining industry, and further that in this wider capacity Mr. Joy will be able to make himself of greater service to the coal industry.

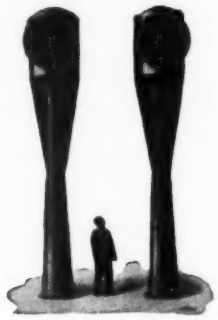
Mr. C. B. Officer has tendered his resignation, effective May 14. Mr. A. F. Millar, with long experience in the company's manufacturing plant at Michigan City, Ind., becomes works manager in charge of all operations at the Claremont, N. H., plant.

Allis-Chalmers Organization Changes

Allis-Chalmers Manufacturing Company's Publicity Department for Power, Electrical and Industrial Machinery now has two sections, effective since January 15. Mr. George Callos has been appointed assistant manager in charge of sales promotion, embracing advertising, bulletins, exhibitions, house organs, etc. Mr. A. K. Birch has been appointed assistant manager in charge of market analysis, sales organization service, embracing price books, data and sales information, and the distribution of literature.

Steam Jet Ejectors

Ingersoll-Rand Company, of New York, announces the publication of a new bulletin covering single, two, and three stage steam jet ejectors for removing air, gas, or vapors from condensers and vacuum chambers in industrial processes. This 28-page bulletin explains the application and characteristics of ejectors and illustrates the operation and arrangement of all types of ejectors with either surface or barometric precoolers, inter and aftercondensers.



The illustration above shows two large high-vacuum boosters which are used to compress process steam to a lower vacuum at which it can be condensed with available cooling water. Also shown is the line-up of standard ejector bodies stocked, from

which any combination of units in one, two, or three stages may be assembled. Copies of the bulletin, No. 9046, are obtainable from the Ingersoll-Rand Company, 11 Broadway, New York, or any of their branch offices.

Safety Goggle

A new type spectacle goggle, equipped with Super-Tough lenses and designated as Style WV1, has just

been added to the line of more than 300 goggles now manufactured by Willson Products, Inc., 278 Thorn Street, Reading, Pa.

Designed for maximum protection and comfort, this new goggle is available in various assemblies to suit the individual requirements of the wearer and is particularly applicable for use in industries where falling or flying objects present a serious eye hazard.

The illustration shows the goggle equipped with clear, wide-view lenses and rocker nose pads; it is also made with comfortable broad saddle nose bridge. The goggles are available with wire screen, leather or transparent sonite sideshields, and with Willsonite lenses when specified.

The manufacturer will be pleased to forward circulars and prices upon request.

CATALOGS and BULLETINS

• ACCESSORIES. *The Jeffrey Mfg. Co.*, Columbus, Ohio. Catalog 675 lists various Jeffrey accessories for use on mine locomotives, coal cutters, cutting machines, drills, etc., many of which are of recent development. 52 pages.

• BELT IDLERS. *The Jeffrey Mfg. Co.*, Columbus, Ohio. Folder 689 illustrates and describes briefly the complete line of Jeffrey belt idlers.

• CLAMPS. *Ohio Brass Company*, Mansfield, Ohio. Bulletin 642-H is a 4-page pamphlet, giving design advantages and catalog information of an improved angle clamp. Bulletin 641-H is a 4-page pamphlet giving design details and catalog information of a neutral clamp.

• DRILLS. *The Jeffrey Mfg. Co.*, Columbus, Ohio. Bulletin 688 describes specifications and uses, with the aid of effective illustrations of the 56-A drilling machine, the A-6 post drill, the A-5 post drill, and the A-7 hand held drill.

• DUST ARRESTER. *The Northern Blower Co.*, 6409 Barberton Avenue, Cleveland, Ohio. Bulletin 100-2 illustrates and describes the Norblo screen type dust arrester. 4 pages.

• INSULATORS. *Ohio Brass Co.*, Mansfield, Ohio. Bulletin 638-H describes OB radio-proof pintype insulators, explaining the theory of the Silentypes design and telling why the units are free from radio interference at a comfortable margin above rated operating voltages. The folder also gives catalog information on the complete line and shows a number of Silentype-equipped lines. 6 pages. Bulletin 643-H gives catalog information on the complete line of small pintype insulators of high-voltage insulator quality, including the standard designs and the multi-ridge units, known as kingpins. 6 pages.

• LOADING MACHINES. *The Jeffrey Mfg. Co.*, Columbus, Ohio. Catalog 685, a well illustrated booklet, gives specifications and uses of the complete line of Jeffrey loading equipment, comprising eight types—ranging from the most modern, high capacity, fully mechanical loading machine to the light-weight, two wheel six-tire loader. 20 pages.

• LOCOMOTIVES. *Goodman Manufacturing Co.*, Chicago, Ill. Bulletin H-378 illustrates single and two-motor locomotives of different sizes used for gathering cars in mine work. The electric cable reel is discussed at length, and the bulletin also contains illustrations and information on explosion proof equipment used in the construction of a safety gathering locomotive. 24 pages. Bulletin H-379 presents both storage battery and combination trolley and storage battery locomotives for use in coal and metal mines or in tunnel work. 16 pages.

• LUBRICATION. *American Chain and Cable Co., Inc.*, York, Pa. Bulletin BH-1058 illustrates and describes the Acco-Morrow pressure lubricator recently announced by the company. The lubricator is made in ten styles—including an oiler type which provides pressure over 500 pounds and a gun type which gives a pressure of 1,000 pounds. 4 pages.

• PAINT. *The Skybryte Co.*, Cleveland, Ohio. New catalog presents uses, coverage, prices, and colors of company's complete line of industrial paints. 16 pages.

• PUMPS. *Allis-Chalmers Mfg. Co.*, Milwaukee, Wis. Bulletin 1651-A describes specifications and detailed applications of the company's complete line of centrifugal pumps, not only showing many new and interesting installations of pumps for general service, but also for city water works, mine pumping, sewage pumping and recent new designs for high pressure, high efficiency boiler feed pumping. 52 pages.

Ingersoll-Rand Co., 11 Broadway, New York City. Bulletin 7069 describes the Ingersoll-Rand end section centrifugal pump, style CRV, built in capacities up to 1,000 gallons per minute for heads up to 500 ft., with pictures of several of these installations, as well as complete tables of performances and dimensions, with explanation for selection of the proper size pump. 16 pages. Bulletin 7067 gives complete specifications and operating characteristics of the Cameron class GT two-stage centrifugal pump. 16 pages.

• RAIL BENDERS. *The West Virginia Rail Co.*, Huntington, W. Va. Leaflet 213 describes the construction and operation of the West Virginia quick rail bender. 2 pages.

• SCREENS. *The Jeffrey Mfg. Co.*, Columbus, Ohio. Bulletin 692 presents specifications, uses and test results of the Jeffrey Map Re-Screen. 4 pages.

Universal Vibrating Screen Company, Racine, Wis. Bulletin "Universal Vibrating Screens," describes specification and application of the complete line of company's screens: 32 pages.

• SOCKET INSTRUMENT. *Westinghouse Elec. & Mfg. Co.*, East Pittsburgh, Pa. Bulletin 2136 illustrates the installation, application and economies of the complete line of Westinghouse electrical instruments, including portable instruments, medium switchboard instruments and socket instruments. 20 pages. Catalog Section 43-600 describes the Westinghouse Type E socket instrument for outdoor and indoor industrial plants, explaining their application, economic advantages, construction details and the selection of sockets and accessories. 20 pages.

• SWITCHES. *I-T-E Circuit Breaker Co.*, Philadelphia, Pa. Bulletin 238 gives specifications and applications of the company's Klamp-Tite switch. 4 pages.

• TRANSFORMERS. *Westinghouse Elec. & Mfg. Co.*, East Pittsburgh, Pa. Bulletin 2125 entitled "Stop Lightning's Costly Raids with CFP Transformers" describes how the "D-Ion" gap by-passes lightning surges, characteristics of the "D-Ion" gap and the advantages of the three-point protection.

• TRANSPORTATION. *Edison Storage Battery*, West Orange, N. J. Booklet "Modern Ore Transportation Underground" is a well illustrated bulletin presenting in condensed form some of the advantages of storage battery power in modern ore transportation underground, and the part played by the alkaline storage battery in making these advantages practicable. 24 pages.

• WASHER EQUIPMENT. *The Morrow Mfg. Co.*, Wellston, Ohio. 6-page leaflet describes the construction and operation of the Morrow-Prins Multi-Flow coal washer.

• WASHING TABLES. *Deister Concentrator Company*, Ft. Wayne, Ind. Bulletin 18-B gives specifications and applications of the No. 6 Deister-Overstrom Diagonal-Deck sand or slime table. 4 pages. Bulletin 10 describes the new Diagonal Deck No. 10 Concento Duplex washing table. 4 pages.

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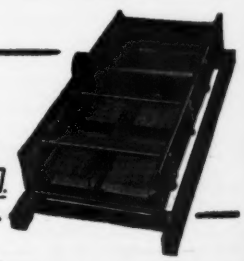

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